User Guide

Fiber Optic Matrix Switchers

FOX Matrix 3200, FOX Matrix 7200

Configurable Fiber Optic Digital Matrix **Switchers**

Extron Electronics
INTERFACING, SWITCHING AND CONTROL

68-1740-02 Rev. C
03 15

Safety Instructions

Safety Instructions • English

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안전 지침 • 한국어

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Class 1 Laser Product

Any service to this product must be carried out by Extron Electronics and its qualified service personnel.

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Produit laser de classe 1

Si ce produit a besoin d'un quelconque entretient, celui-ci doit être fait par Extron Electronics et son personnel qualifié.

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Conventions Used in this Guide

Notifications

The following notifications are used:

WARNING: Potential risk of severe injury or death.
AVERTISSEMENT : Risque potentiel de blessure grave ou de mort.

CAUTION: Risk of minor personal injury.
ATTENTION : Risque de blessure mineure.

NOTE: A note draws attention to important information.

TIP: A tip provides a suggestion to make working with the application easier.

Software Commands

Commands are written in the fonts shown here:

```
^AR Merge Scene,,Op1 scene 1,1 ^B 51 ^W^C
[Ø1] R ØØØ4 ØØ3ØØ ØØ4ØØ ØØ8ØØ ØØ6ØØ [Ø2] 35 [17] [Ø3]
```

Esc X13 * X18 * X25 * X28 * X26 CE ←

NOTE: For commands and examples of computer or device responses mentioned in this guide, the character "Ø" is used for the number zero and "O" represents the capital letter "o."

Computer responses and directory paths that do not have variables are written in the font shown here:

```
Reply from 2Ø8.132.18Ø.48: bytes=32 times=2ms TTL=32
C:\Program Files\Extron
```

Variables are written in slanted form as shown here:

```
ping xxx.xxx.xxx.xxx –t
SOH R Data STX Command ETB ETX
```

Selectable items, such as menu names, menu options, buttons, tabs, and field names are written in the font shown here:

From the **File** menu, select **New**.

Click the **OK** button.

Specifications Availability

Product specification are available on the Extron website, **www.extron.com**.

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Introduction

WARNING: The FOX matrix switcher outputs continuous invisible light (Class 1 rated), which may be harmful to the eyes; use with caution.

- Do not look into the rear panel fiber optic cable connectors or into the fiber optic cables themselves.
- Plug the attached dust cap into the optical transceiver when the fiber optic cable is unplugged.

AVERTISSEMENT : Le grilles de commutation de la gamme FOX émet une lumière invisible en continu (conforme à la classe 1) qui peut être dangereux pour les yeux, à utiliser avec précaution.

- Ne regardez pas dans les connecteurs de câble fibre optique sur le panneau arrière ou dans les câbles fibre optique eux-mêmes.
- Branchez la protection contre la poussière dans l'ensemble émetteur/récepteur lorsque le câble fibre optique est débranché.

- About this Guide
- About the FOX Matrix Switchers
- Features

About this Guide

This guide contains installation, configuration, and operating information for the Extron FOX Matrix 3200 Switcher and FOX Matrix 7200 Switcher. These customizable matrix switchers support up to 32 (FOX Matrix 3200) or 72 (FOX Matrix 7200) inputs and outputs.

NOTE: In this guide, "FOX matrix switcher" and "switcher" refer to either switcher model unless otherwise specified.

About the FOX Matrix Switchers

The FOX matrix switchers (see **figure 1** on the next page) distribute optical and electronic input signals to one or more optical and electronic outputs. The matrix switchers can route multiple input/output configurations simultaneously. The switchers are configurable, assembled from individual input/output (I/O) boards, each of which supports 8 inputs by 8 outputs in a combination of the following types of board:

- **Singlemode and multimode fiber optic I/O 88 reclocking boards** — These non-pathologically-compliant fiber optic boards route signals that are compatible with all Extron FOX 500, FOXBOX, FOX II, and PowerCage FOX fiber optic product lines.
- **FOX 3G I/O 88 SM P board** — This pathologically-compliant fiber optic board passes digital signals in broadcasting applications, while addressing the compatibility issues of passing pathological signals generated from 3G-SDI, HD-SDI, and SDI signals over fiber optic systems, including those defined by RP 178 and RP 198.
- **BNC 3G/HD/SD-SDI 88 I/O board** — This pathologically-compliant board supports and passes 3G-SDI, HD-SDI, and SD-SDI signals in their native (electronic) format.

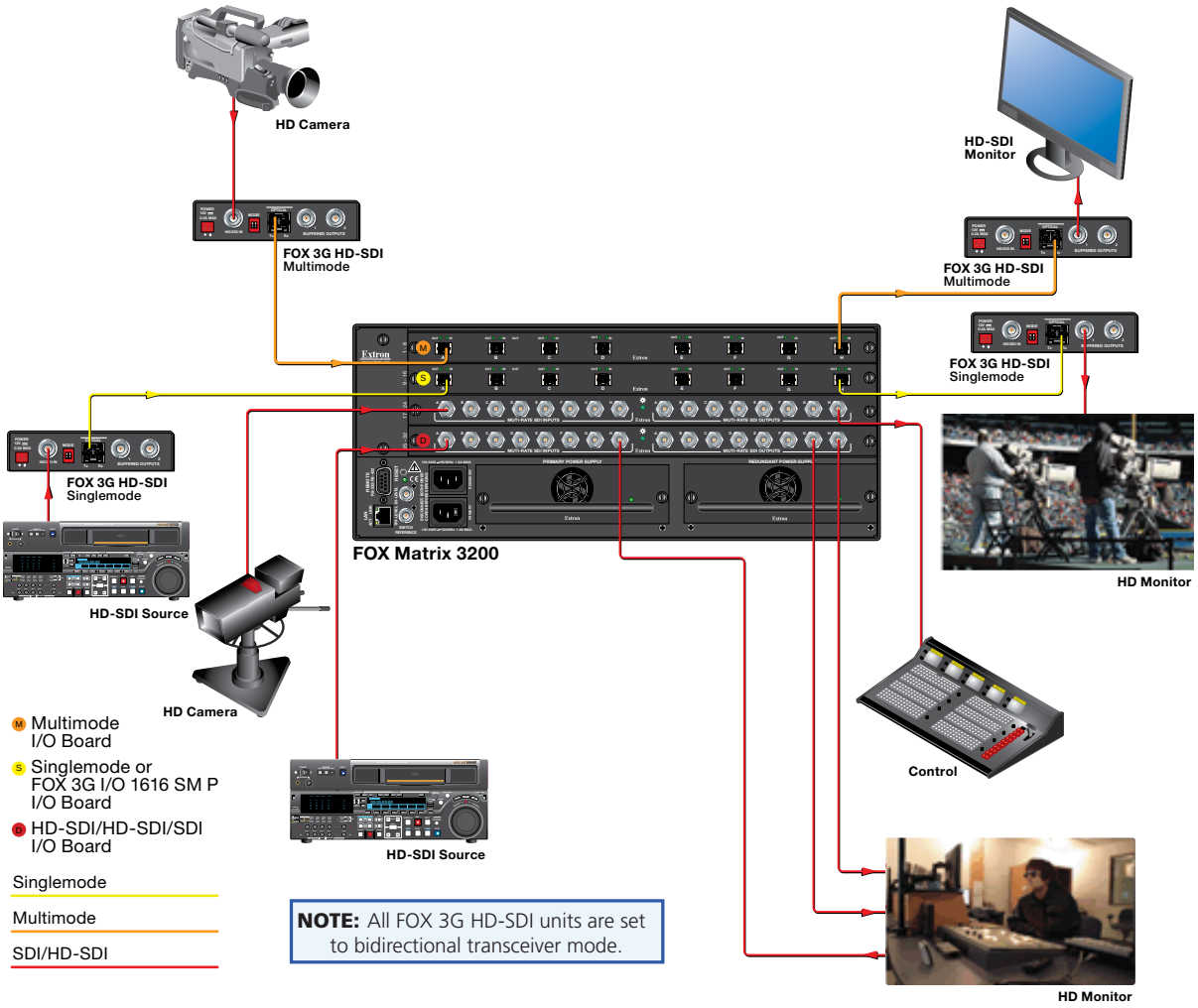


Figure 1. Typical FOX Matrix 3200 Application

NOTE: The non-pathologically-compliant multimode and singlemode fiber optic I/O boards are physically and functionally identical, with the exception of the effective range of transmission. In this guide, any reference to fiber optic transmission applies to either transmission mode unless otherwise specified. The pathologically-compliant fiber optic I/O board is identified separately where appropriate.

By adding or removing I/O boards, the FOX matrix switcher is expandable and contractable within the following ranges:

- **FOX Matrix 3200** — Includes up to four I/O boards. It is expandable from an 8-input by 8-output matrix to a 32-input by 32-output matrix.
- **FOX Matrix 7200** — Includes up to nine I/O boards. It is expandable from an 8-input by 8-output matrix to a 72-input by 72-output matrix.

The Extron proprietary fiber optic signal, generated by FOX 500, FOXBOX, PowerCage FOX, and FOX II transmitters, can include video, stereo audio, and transmitter-to-receiver RS-232 serial communications. The video component of the signal can be of a variety of formats, depending on the transmitter and receiver:

- RGB video
- 3G-SDI, HD-SDI, or SDI video
- Digital Visual Interface (DVI) video
- Low resolution (composite video or S-video)

NOTES:

- Compatible optical signals are digital signals from 270 Mbs through 4.25 Gbps, sent and received via fiber optic small form factor pluggable (SFP) modules. The FOX matrix switchers support all compatible optical signals, whether transmitted or received by an Extron FOX system component or not.
- The Extron FOX 500, FOXBOX, and PowerCage FOX transmitter-to-receiver communications, including the serial link, occupy one matrix switcher input and output. This matrix switcher also supports the Extron FOX return (receiver-to-transmitter) serial communications, but returning this signal stream to the transmitter uses a separate matrix switcher input and output.

The switchers input and output the optical signals that they route on fiber optic transceiver modules and the 3G-SDI, HD-SDI, and SDI video signals on BNC connectors.

The switcher has two 100 VAC to 240 VAC, 50-60 Hz, 175-watt power supplies that provide worldwide power compatibility and reliability.

The matrix switcher is a single box solution to complex fiber optic and broadcast signal routing applications. Each input and output is individually isolated and buffered. Any input can be switched to any one output or all outputs with virtually no crosstalk or signal noise between channels.

The matrix switcher can be remotely controlled using either the Extron Matrix Switchers Control Program or the Simple Instruction Set (SIS). Control is available via:

- A rear panel Remote RS-232/RS-422 port
- A rear panel LAN port
- A front panel RS-232 serial Config (configuration) port

The SIS is a set of basic ASCII code commands that provide simple control through a control system or PC without the need to enter long strings of code. SIS commands can be entered via any of the ports listed above.

The switcher can be operated remotely by any of the following connected to a serial port or LAN port:

- A control system
- A PC computer
- An Extron MKP 2000 or remote control panel
- An Extron MKP 3000 remote control panel
- (**RS-232 or RS-422 only**) An Extron MCP 1000 remote control panel, an MKP 1000 remote keypad, or both

The matrix switcher is housed in a rack-mountable, metal enclosure with mounting flanges for standard 19-inch racks. The sizes are as follows:

- **FOX Matrix 7200 —** 8U high
- **FOX Matrix 3200 —** 4U high

Fiber Cable Transmission Modes

Two versions of non-pathologically-compliant FOX matrix switcher fiber optic I/O board are documented in this guide. They are categorized by the type of fiber optic cable, multimode or singlemode, which defines the effective range of transmission:

- **Multimode** — Long distance, up to 300 m (985 feet)
- **Singlemode** — Very long distance, up to 30 km (18.75 miles)

NOTES:

- All transceiver modules on a fiber optic I/O board, as delivered from Extron, are configured the same; either all multimode or all singlemode.
- You can mix multimode and singlemode fiber optic I/O boards in a FOX matrix switcher, but you must ensure that you connect the proper transmission mode fiber cables to the board.

Features

Fiber optic inputs and outputs — With fiber optic I/O boards, the switchers input and output fiber optic signals on SFP optical connectors. The fiber optic I/O boards support digital signals from 270 Mbs through 4.25 Gbps.

3G-SDI, HD-SDI, or SDI inputs and outputs — With 3G/HD/SD-SDI I/O boards, the switchers input and output SDI and HD-SDI signals on BNC connectors. The 3G/HD/SD-SDI I/O boards support multi-rate SDI at rates up to 2.97 Gbps, and comply with SMPTE 259M-C, 292M, 424M, and ITU digital video standards.

Cross-format compatibility —

- An input on an 3G/HD/SD-SDI I/O board can be tied to an output on a fiber optic I/O board or another 3G/HD/SD-SDI I/O board.
- An input on a fiber optic I/O board can be tied to an output on an 3G/HD/SD-SDI I/O board or another fiber optic I/O board.

Switching flexibility — The switcher provides individually buffered, independent matrix switched outputs.

- **Tie any input to any or all outputs**.
- **Quick multiple tie** — Multiple inputs can be switched to multiple outputs simultaneously. This allows all displays (outputs) to change from source to source at the same time.

Input link detection — In critical environments or unmanned, remote locations, it may be vital to know that sources are active and switching. The switcher confirms that input sources are active by detecting light. Link detection provides instantaneous feedback via the serial ports or LAN port of the switcher. The input information can be displayed on any control system or in a Windows®-based control program on a local-area network (LAN) or Internet (IP) connection.

Rooming — The switcher can be programmed to group multiple outputs to specific “rooms”, allowing them to have their own presets.

Operational reliability — The FOX matrix switcher can support round-the-clock operation in mission-critical applications, using a combination of hot-swappable components and redundant power supplies.

- **Field upgradable, hot-swappable modular design** — You can repair, upgrade, reconfigure, or expand the matrix by simply installing a new I/O board or replacing a board of one type with one of another. Hot-swappable components let you replace any I/O board at any time without powering down the switcher.
- **Power redundancy** — The built-in redundancy ensures zero downtime and no loss of functionality through all but catastrophic power failure.
  - **Two AC power inputs** — The switcher can remain powered through any power interruption short of a simultaneous loss of power on both power sources.
  - **Primary and redundant, hot-swappable power supplies** — The hot-swappable, externally mounted redundant power supply is configured to automatically take over the load from the primary supply in the case of a failure.

    The complete power circuit, from the plug, through the power supply, to the insertion of the power onto the power distribution plane, is separate and redundant (see figure 2). If the installation includes uninterruptible or completely separate power sources, the switcher remains powered up through any power interruption except a simultaneous loss of power on both power sources.

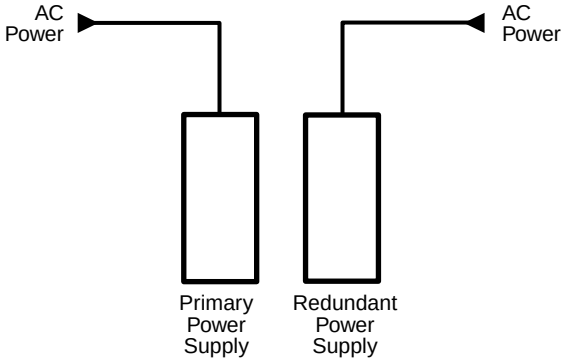


Figure 2. Redundant Power Supply Backs up Primary

The hot-swappable redundant power supply means no downtime for the switcher and no loss of functionality should one power supply fail. Should a primary power supply fail, the redundant power supply immediately assumes the load of the failed primary supply. A failed power supply is easily replaceable from the rear at any time without powering down the matrix and with no tools required.

  - **Ease of maintenance** — A failed power supply can be easily replaceable from the rear at any time without powering down the matrix, and with no tools required.
  - **Power supply status LEDs** — Front panel and rear panel LEDs indicate the status of the primary and redundant power supplies.
  - **Hot-swappable fans** — The hot-swappable, externally mounted fans allow quick replacement to avert overheating in the case of a failure. Fans can be replaced without powering down the switcher.
- **Operational flexibility** — Operations such as input/output selection and setting of presets can be performed using a variety of local and remote control mechanisms:
  - Front panel controller
  - Windows-based Matrix Switchers Control Program
  - Simple Instruction Set (SIS)
  - Remote control panels and keypads

SNMP support for remote monitoring — Supports the Simple Network Management Protocol (SNMP) internet-standard protocol, allowing IT personnel to manage devices on the IP network.

Laser controls — Non-pathologically-compliant fiber optic boards can be set, via SIS commands, to individually or globally disable the output laser drivers so that a driver does not output light. They can also be set, individually or globally, to automatic so that a driver turns on when a tie is made involving that driver or turns off when no tie is made.

Upgradeable firmware — The firmware that controls all switcher operation can be upgraded in the field via either serial port or the Ethernet port, without taking the switcher out of service. Firmware upgrades are available for download at **www.extron.com**, and can be installed using the Windows-based control program or the built-in HTML pages.

Labeling — The Button Label Generator software, available at **www.extron.com**, lets you create labels to place in the front panel I/O buttons, with names, alphanumeric characters, or color bitmaps for easy and intuitive input and output selection.

Global memory presets — 32 (FOX Matrix 3200) or 64 (FOX Matrix 7200) global memory presets are a time-saving feature that lets you set up and store input/output configurations in advance. You can then recall those configurations, when needed, with a few simple steps. The presets are available via front panel operation or serial port or Ethernet control.

Rack mounting — Rack mountable in any conventional 19-inch wide rack.

Front panel security lockout modes (Executive mode) — If a matrix switcher is installed in an open area, where operation by unauthorized personnel may be a problem, a security lockout mode can be implemented. When the front panel is locked, a special button combination or SIS command is required to unlock the front panel controller and make the front panel fully operational.

I/O grouping — Allows the matrix to be virtually divided into smaller subswitchers, making installation and control easier. I/O grouping limits the selection of inputs and outputs to members of the same group. I/O grouping allows specific outputs, such as those designated for a specific purpose, to be grouped together.

Video genlock (SDI / HD-SDI inputs only) — Allows for vertical interval switching and enables smooth, seamless transitions when switching between synchronous video sources. Separate bi-level (SDI) and tri-level (HD-SDI) references are provided on two separate BNC connectors.

Permanent, rechargeable battery — The matrix switcher has a rechargeable lithium battery to track time of day when power is disconnected.

WARNING: There is a danger of explosion if the battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the instructions of the manufacturer.

AVERTISSEMENT : Si la pile est mal remplacée, il y a un risque d'explosion. Remplacez la batterie seulement avec le même type ou un type similaire de pile, recommandé par le fabricant. Débarrassez-vous des piles utilisées selon les instructions du fabricant.

ATTENTION:

- Non-Extron personnel must not attempt to remove the battery. Doing so voids the warranty.
- Du personnel ne faisant pas partie d'Extron ne doit pas essayer de retirer la batterie. Cela annulerait la garantie.

Installation

This section details the installation and configuration of the FOX matrix switchers, including:

- **Setup and Installation Checklist**
- **Rear Panel Boards, Cabling, and Features**
- **Front Panel Configuration Port**

Setup and Installation Checklist

Get Ready

- ☐ Familiarize yourself with the FOX matrix switcher.
- ☐ Obtain IP setting information for the matrix switcher from the local network administrator. Read the **Ethernet Connection** section, beginning on page 117.

Configure the Matrix Switcher

- ☐ Install the desired I/O boards (**page 110**).

Perform Physical Installation

- ☐ If desired, install the switcher in a rack (see **Mounting the Switcher** on page 109).
- ☐ If desired, create (**Page 92**) and replace (**Page 115**) button labels.
- ☐ Cable input and output devices to the I/O boards (**page 11**).
- ☐ If desired, connect computers or control systems to any of the remote control ports on the switcher (two serial ports [**page 13** and **page 17**] and a LAN port [**page 13**]).
- ☐ Connect power (**page 16**).
- ☐ Test the switcher by creating a tie (**page 27**).

Ancillary Operations

- ☐ Install the Matrix Switchers Control Program (**page 72**).

Rear Panel Boards, Cabling, and Features

NOTE: Figure 3 shows a FOX Matrix 3200. **Figure 4**, on the next page, shows a FOX Matrix 7200. The two models have similar features, but are in different-sized enclosures and the features are arranged differently. The FOX Matrix 7200 has two fan assemblies.

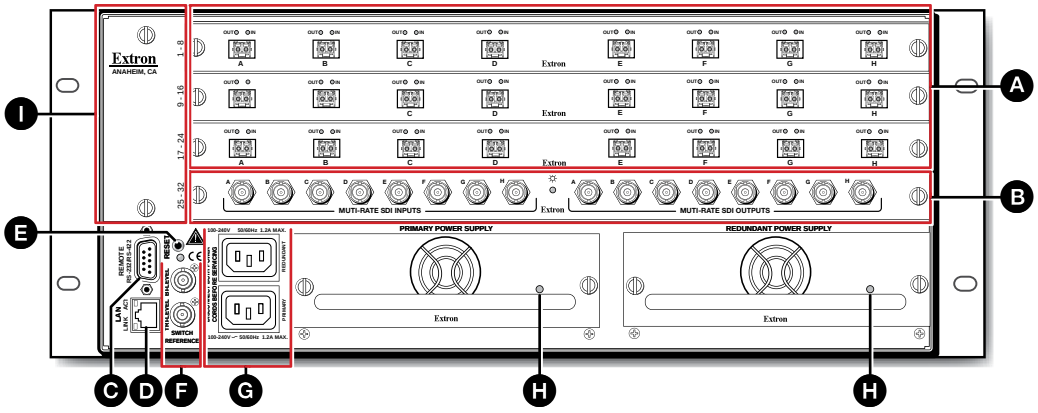


Figure 3. FOX Matrix 3200 Fiber Optic Matrix Switcher Rear Panel

ATTENTION:

- Use electrostatic discharge (ESD) precautions (be electrically grounded) when you make connections. ESD is damaging, even if you cannot feel, see, or hear it.
- Prenez des précautions contre les décharges électrostatiques (ESD) (soyez électriquement relié à la terre) lorsque vous effectuez des connexions. Les ESD peuvent endommager l'équipement, même si vous ne pouvez pas le sentir, le voir ou l'entendre.
- Remove system power before making all connections
- Débranchez l'alimentation du système avant de faire n'importe quelle connexion.

- **A Fiber optic boards with connectors and LEDs** (see **page 11**)
- **B 3G-SDI, HD-SDI, and SDI boards with connectors and LEDs** (see **page 12**)
- **C Remote RS-232 / RS-422 port** (see **page 13**)
- **D Ethernet connection (LAN connector)** (see **page 13**)
- **E Reset button** (see **page 14**)
- **F Switch Reference connectors** (see **page 15**)
- **G Power connectors** (see **page 16**)
- **H Power supply modules and indicator LEDs** (see **page 16**)
- **I Cooling fan assembly** (see **Removing and Installing a Fan Module** on page 114)

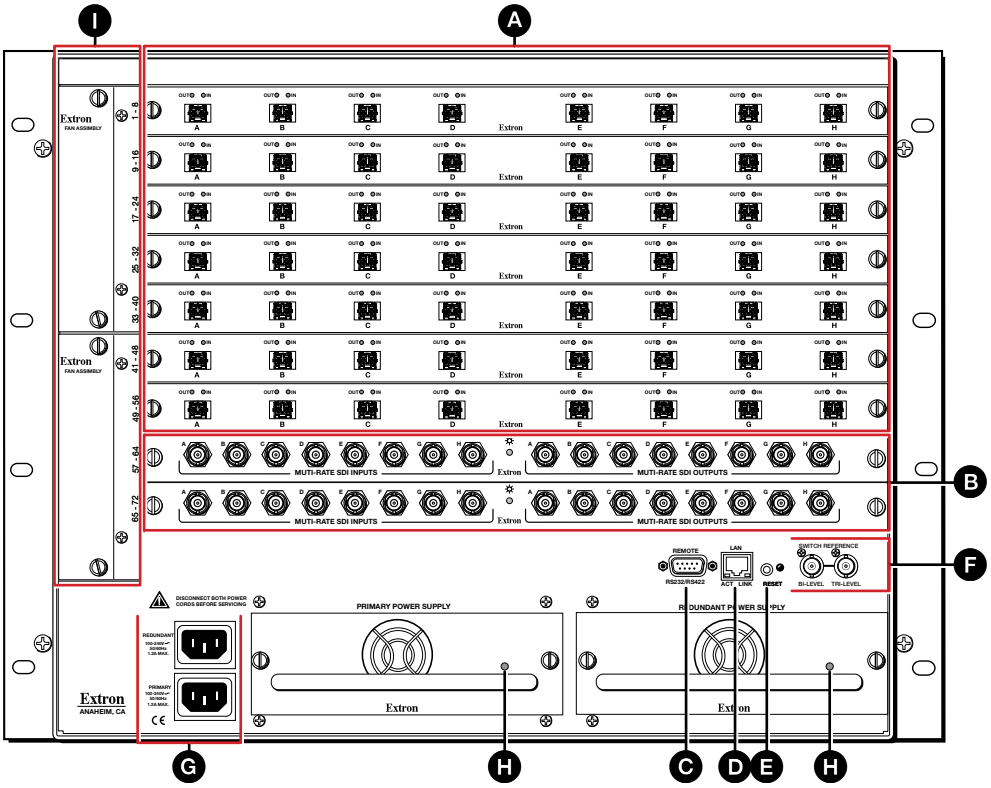


Figure 4. FOX Matrix 7200 Fiber Optic Matrix Switcher Rear Panel

- **A Fiber optic boards with connectors and LEDs** (see **page 11**)
- **B 3G-SDI, HD-SDI, and SDI boards with connectors and LEDs** (see **page 12**)
- **C Remote RS-232 / RS-422 port** (see **page 13**)
- **D Ethernet connection (LAN connector)** (see **page 13**)
- **E Reset button** (see **page 14**)
- **F Switch Reference connectors** (see **page 15**)
- **G Power connectors** (see **page 16**)
- **H Power supply modules and indicator LEDs** (see **page 16**)
- **I Cooling fan assembly** (see **Removing and Installing a Fan Module** on page 114)

I/O Boards

As shown in figure 5, each I/O board is identified by the input and output numbers supported by the board position, which are printed on the side of each fan module (1 - 8, 9 - 16, and so on). The transceiver modules on fiber optic I/O boards are identified as A through H.

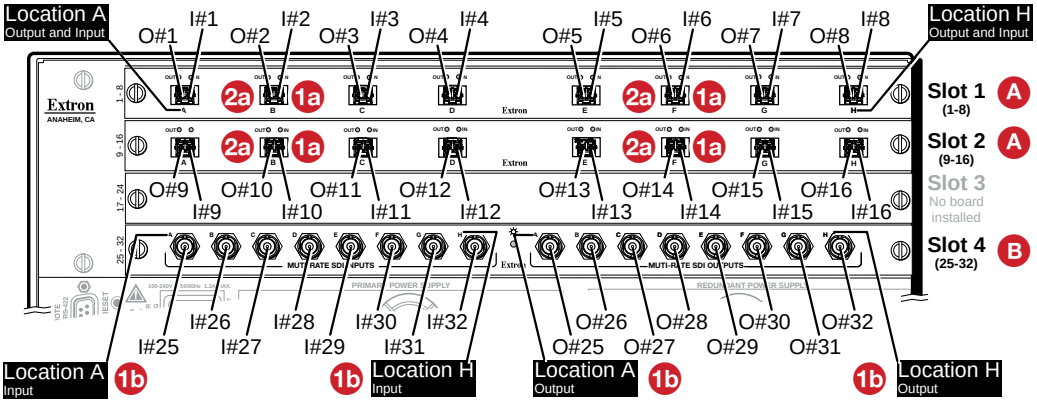


Figure 5. Arrangement of Inputs and Outputs on the I/O Boards

NOTE: On the fiber optic I/O boards, the output on the transceiver module is to the *left* of the input.

Slot	Inputs and Outputs	Slot	Inputs and Outputs
1	1 through 8	**5***	33 through 40
2	9 through 16	**6***	41 through 48
3	17 through 24	**7***	49 through 56
4	25 through 32	**8***	57 through 64
		9*	65 through 72

* FOX Matrix 7200 only

Locations A through H correspond to the input and output numbers identified by the board position numbers. For example, the input and output numbers supported by the I/O board in location 9 - 16 (slot 2) are as follows: A = 9, B = 10, C = 11, D = 12, E = 13, F = 14, G = 15, and H = 16.

On the fiber optic I/O boards (A), locations A through H correspond to the transceiver modules, each of which includes an input (1a) and an output (2a). Therefore, locations A through H are numbered from left to right.

On the 3G/SDI/HD-SDI I/O boards (B), inputs (1b) and outputs (2b) are grouped separately, with inputs A through H on the left and outputs A through H on the right.

Fiber optic boards

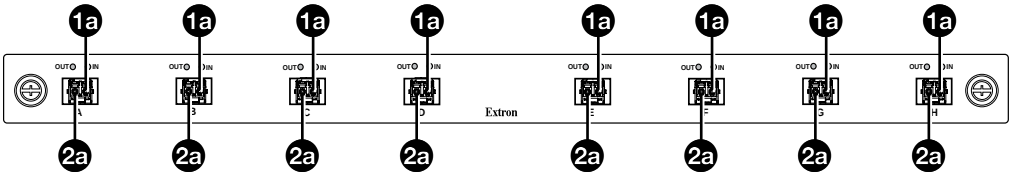


Figure 6. Fiber Optic Board

A Fiber optic board, connectors (see **figure 3** on page 8 and **figure 4** on page 9) —

WARNING: The FOX matrix switchers fiber optic I/O boards output continuous invisible light (Class 1 rated), which may be harmful to the eyes; use with caution. Plug the attached dust cap into the optical transceiver when the fiber optic cable is unplugged.

AVERTISSEMENT : Le grilles de commutation de la gamme FOX cartes d'entrée/sortie fibre optique émet une lumière invisible en continu (conforme à la classe 1) qui peut être dangereux pour les yeux, à utiliser avec précaution Branchez la protection contre la poussière dans l'ensemble émetteur/récepteur lorsque le câble fibre optique est débranché.

NOTES:

- Ensure that you use the proper fiber cable for your I/O board. Typically, singlemode fiber has a yellow jacket and multimode cable has an orange or aqua jacket.
- Unlike most Extron transmitters and receivers, which output an optical stream on one connector in a block and receive a return optical stream on the second connector in the same block, the FOX matrix switchers uses one connector on the block as an input and the second connector on the same block as a separate output.
- All transceiver modules on a fiber optic I/O board, as delivered from Extron, are configured the same: either all multimode or all singlemode.
- You can mix multimode and singlemode fiber optic I/O boards in a FOX matrix switcher, but you must ensure that you connect the proper transmission mode fiber cables to the board.

1a Input connector and LED — For all one-way video, audio, and serial communications output by a transmitter, connect a fiber optic cable to the Input LC connector (see figure 7).

Connect the free end of this fiber optic cable to the Optical Tx LC connector on a FOXBOX Tx transmitter or to any other compatible fiber optic device.

NOTES:

- For a FOX 500 transmitter, connect this fiber optic cable to the Optical 1 LC connector.
- **Alternatively**, for the serial return, (receiver-to-transmitter) function, connect the far end of the cable to the Optical 2 connector on a receiver.

Input LED — See **Fiber optic I/O board LED indications** on the next page.

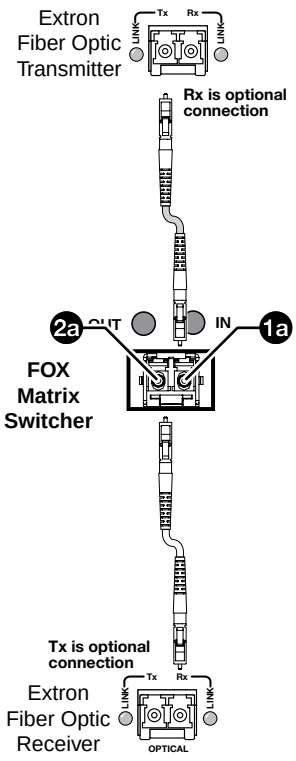


Figure 7. Optical Connections

2a Output connector — For all one-way video, audio, and serial communications output to a receiver, connect a fiber optic cable to the Output LC connector (see **figure 7**, on the previous page).

Connect the far end of this fiber optic cable to the Optical Rx connector on a FOXBOX Rx receiver or to any other compatible fiber optic device.

NOTES:

- For a FOX 500 receiver, connect this fiber optic cable to the Optical 1 LC connector.
- **Alternatively**, for the serial return, (receiver-to-transmitter) function, connect the far end to the Optical RX or Optical 2 connector on a transmitter.

Output LED — See "Fiber optic I/O board LED indications," below.

Fiber optic I/O board LED indications

On the fiber optic I/O boards, the input and output LEDs on the transceivers provide useful indications of the status of the lasers and the reclocking function. See the table below.

Definition	OUT / IN Output LED indication	Input LED indication	Definition
Reclocked at 4.25 Gbps	On	On	Reclocked at 4.25 Gbps
Not reclocked, laser off, or no signal	Off	Off	Not reclocked or no signal
Non-4G signal present or not reclocked	Fast blink	Fast blink	Non-4G signal present or not reclocked

NOTE: If the reclocking feature is bypassed (see the **Set output reclocker** SIS command on page 60), the output LED is always on.

3G/HD/SD-SDI boards

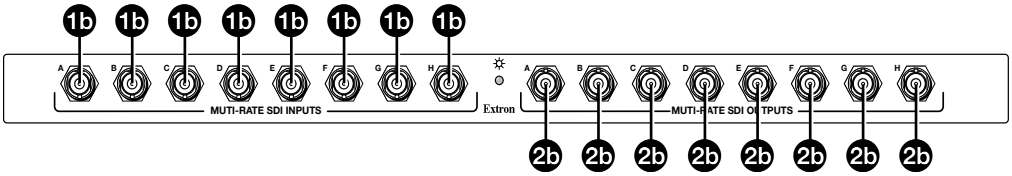


Figure 8. 3G/HD/SD-SDI Board

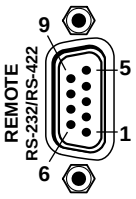
B BNC board with connectors (see **figure 3** on page 8 and **figure 4** on page 9) —

1b Multi-rate SDI Input connectors — Connect 3G-SDI, HD-SDI, SDI or video inputs to these BNC connectors.

2b Multi-rate SDI Output connectors — Connect digital displays to these BNC connectors.

Remote Port

C **Remote RS-232/RS-422 connector** (see **figure 3** on page 8 and **figure 4** on page 9) — Connect a host device, such as a computer or touchpanel control, to the switcher via this 9-pin D connector for serial RS-232 or RS-422 control (see figure 9).



Pin	RS-232	Function	RS-422	Function
1	—	Not used	—	Not used
2	Tx	Transmit data	Tx–	Transmit data (–)
3	Rx	Receive data	Rx–	Receive data (–)
4	—	Not used	—	Not used
5	Gnd	Signal ground	Gnd	Signal ground
6	—	Not used	—	Not used
7	—	Not used	Rx+	Receive data (+)
8	—	Not used	Tx+	Transmit data (+)
9	—	Not used	—	Not used

Figure 9. Remote RS-232/RS-422 Connector

See **Programming Guide** on page 52 for definitions of the SIS commands (serial commands to control the switcher via this connector) and **Matrix Software** on page 71 for details on how to install and use the control software.

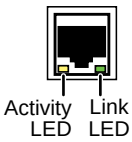
NOTE: The switcher can support either the RS-232 or the RS-422 serial communication protocol, and can operate at 9600, 19200, 38400, or 115200 baud rates.

See the **Command and Response Table for IP- and SNMP-Specific SIS Commands** on page 68 to configure this port under SIS control.

If desired, connect an MKP 2000 or MKP 3000 remote control panel to the Remote RS-232/RS-422 connector. See the *MKP 2000 Remote Control Panel User Guide* or the *MKP 3000 User Guide* for details.

Ethernet Connection

D **LAN port** (see **figure 3** and **figure 4**) **—** For IP control of the system, connect the matrix switcher to a PC or to an Ethernet LAN via this RJ-45 connector. You can use a PC to control the networked switcher with SIS commands from anywhere in the world. You can also control the switcher from a PC that is running the Extron Matrix Switchers Control Program or has downloaded HTML pages from the switcher.



Link LED indicator — The green (link) LED indicates that the switcher is properly connected to an Ethernet LAN. This LED should light steadily.

Act LED indicator — The yellow (activity) LED indicates transmission of data packets on the RJ-45 connector. This LED should flicker as the switcher communicates.

Cabling

It is vital that your Ethernet cables be the correct cable type and that they be properly terminated with the correct pinout. Ethernet links use Category (CAT) 3, 5e, or CAT 6, unshielded twisted pair (UTP) or shielded twisted pair (STP) cables, terminated with RJ-45 connectors. Ethernet cables are limited to a length of 328 feet (100 meters).

NOTES:

- Do not use standard telephone cables. Telephone cables do not support Ethernet or Fast Ethernet.
- Do not stretch or bend cables. Transmission errors can occur.

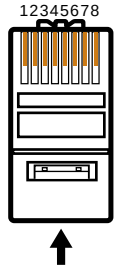
The cable used depends on your network speed. The switcher supports both 10 Mbps (10Base-T — Ethernet) and 100 Mbps (100Base-T — Fast Ethernet), half-duplex and full-duplex Ethernet connections.

- 10Base-T Ethernet requires CAT 3 UTP or STP cable at minimum.
- 100Base-T Fast Ethernet requires CAT 5e UTP or STP cable at minimum.

RJ-45 connector wiring

The Ethernet cable can be terminated as a straight-through cable or a crossover cable and must be properly terminated for your application (see figure 10).

- **Crossover cable —** Direct connection between the computer and the FOX matrix switcher
- **Patch (straight) cable —** Connection of the FOX matrix switcher to an Ethernet LAN



Crossover Cable

Pin	End 1 Wire color	End 2 Wire color
1	White-green	White-orange
2	Green	Orange
3	White-orange	White-green
4	Blue	Blue
5	White-blue	White-blue
6	Orange	Green
7	White-brown	White-brown
8	Brown	Brown
	T568A	T568B

A cable that is wired as T568A at one end and T568B at the other (Tx and Rx pairs reversed) is a "crossover" cable.

Straight-through Cable

Pin	End 1 Wire color	End 2 Wire color
1	White-orange	White-orange
2	Orange	Orange
3	White-green	White-green
4	Blue	Blue
5	White-blue	White-blue
6	Green	Green
7	White-brown	White-brown
8	Brown	Brown
	T568B	T568B

A cable that is wired the same at both ends is called a "straight-through" cable, because no pin-pair assignments are swapped.

Figure 10. RJ-45 Connector and Pinout Tables

Reset Button and LED

E **Reset button** (see **figure 3** on page 8 and **figure 4** on page 9) — The recessed Reset button initiates four levels of matrix switcher reset. For four different reset levels, press and hold the button while the switcher is running or while you power up the switcher (see **Reset Operations** on page 43 for details).

- **Hard (mode 1) reset —** Restore the switcher to the default factory conditions and return the switcher to the default firmware that shipped with the unit.
- **Events (mode 3) reset** — Toggles events monitoring on and off.
- **IP settings (mode 4) reset** — Reset the IP functions of the switcher.

NOTE: The IP settings reset does not replace any user-installed firmware.

- **Absolute (mode 5) reset** — Restore the switcher to the default factory conditions.

NOTES:

- Factory loaded firmware is active until it is replaced or the power is cycled.
- Hard reset does not clear the current configuration.

Switch Reference Connections

F **Switch Reference connectors for bi-level and tri-level sync** (see **figure 3** on page 8 and **figure 4** on page 9) — **(3G, HD-SDI, and SDI inputs and outputs only)** Connect an external sync signal to this BNC connector to genlock the video signal in broadcast or other sync-critical applications.

The switcher makes ties to inputs on 3G/SDI/HD-SDI I/O boards during the vertical interval period of the tied video, resulting in glitch-free video switching when the input devices are also using the same sync timing. The FOX matrix switcher can use an external signal to synchronize switching during the vertical interval. Without this external sync locking feature, switching between inputs could result in brief video or picture rolling (sync loss) or a brief change in the picture size.

Figure 11 shows a basic external sync configuration. The Bi-level or Tri-level sync connector receives the timing signal. A tee connector attached to the cable allows the signal to be passed on to another video device, if required. Terminate the tee connector if desired.

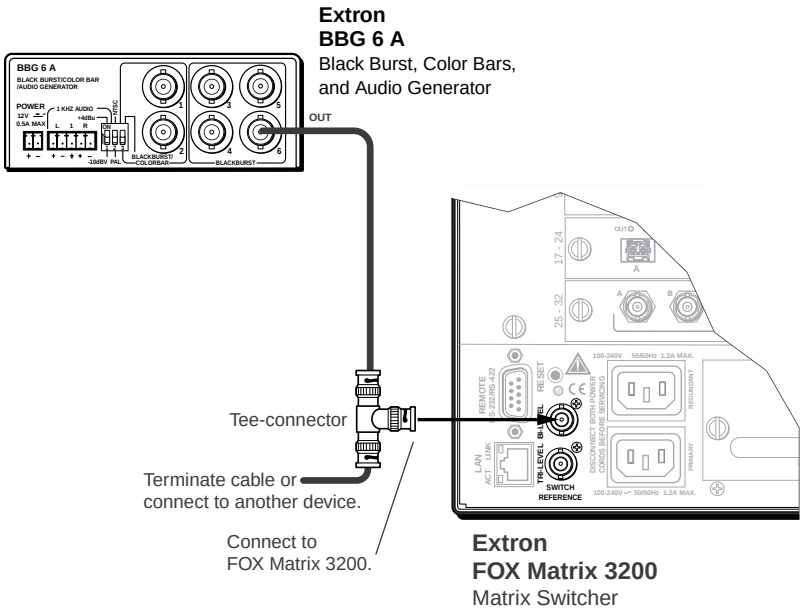


Figure 11. Simple FOX Matrix Switcher External Sync Connection Example

Figure 12 on the next page shows another configuration, in which the timing source passes through three video cameras and a video scan converter before connecting to the switcher. This type of video camera is capable of synchronizing with the external timing source for video editing applications.

NOTE: The Switch Reference connectors are tied into the I/O grouping feature of the switcher:

- Ties to any input in I/O group 1 use the tri-level sync reference.
- Ties to any output in I/O group 2 use the bi-level sync reference.

See **I/O grouping** on page 33 to assign sync-critical inputs and outputs to the appropriate I/O groups.

If no external sync timing source is connected to the switcher, switching occurs immediately.

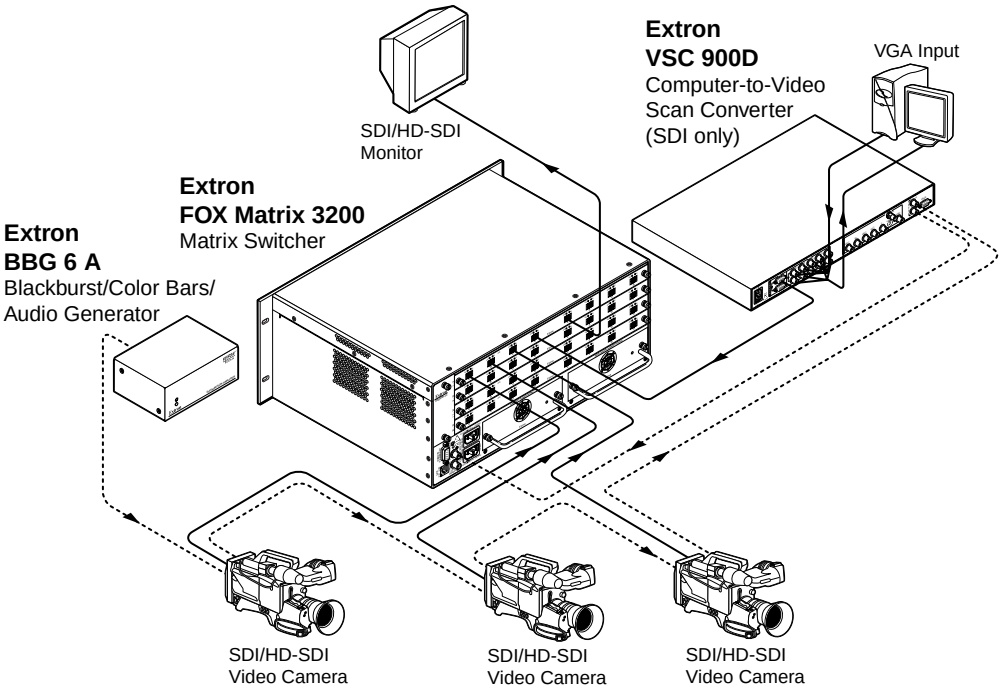


Figure 12. Multiple Device Example of a FOX Matrix 3200 External Sync

Power Supply Modules and Indicator LEDs

G **Primary and Redundant AC power connectors** (see **figure 3** on page 8 and **figure 4** on page 9) — Plug standard IEC power cords into these connectors to connect the switcher to 100 VAC to 240 VAC, 50 or 60 Hz power sources.

> **NOTE:** For the most reliable power, connect the power cord from the Redundant power connector to either an uninterruptible power source or to a power source that is completely independent from the primary power source.

H **Primary and Redundant power supply indicator LEDs** (see **figure 3** and **figure 4**) —

Green — Indicates that the associated power supply is operating within normal tolerances.

Red — Indicates that the associated power supply is operating outside the normal tolerances or has failed. See **Removing and Installing a Power Supply Module** on page 113 section to replace the power supply.

Cooling Fan Assemblies

I **Primary and Redundant cooling fans** (see **figure 3** and **figure 4**) — Cool the equipment. If a fan has failed, replace it at your earliest opportunity. See **Removing and Installing a Fan Module** on page 114 to replace the fans.

Front Panel Configuration Port

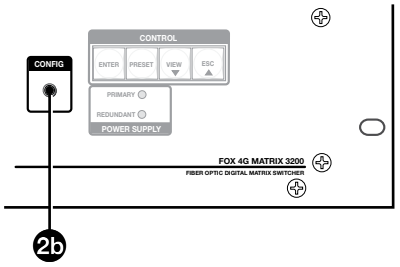
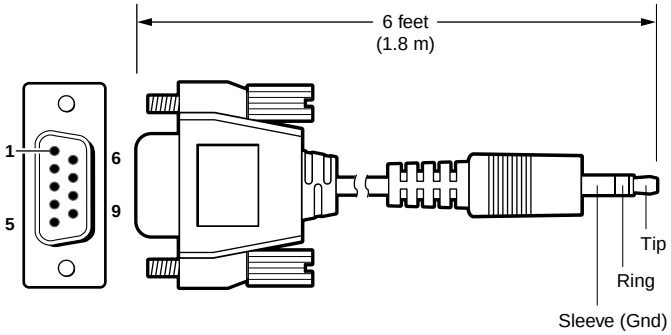


Figure 13. Front Panel Configuration (Config) Port

Ⓐ **Configuration port** — This 2.5 mm mini stereo jack serves the same serial communications function as the rear panel Remote port, but it is easier to access than the rear port after the matrix switcher has been installed and cabled. The optional 9-pin D to 2.5 mm mini jack TRS RS-232 cable (see figure 14) can be used for this connection.



9-pin D	Connection	TRS Plug
Pin 2	Rx line on the computer	Tip
Pin 3	Tx line on the computer	Ring
Pin 5	Signal ground on the computer	Sleeve

Figure 14. Optional 9-pin TRS RS-232 Cable

NOTES:

- This port is independent of the rear panel Remote port and is not affected by changes to the protocol of the rear panel port. The protocol of the front panel port can be changed under SIS command control only. See the **Command and Response table for IP- and SNMP-Specific SIS commands** on page 68 to configure this port under SIS control.
- A front panel Configuration port connection and a rear panel Remote port connection can both be active at the same time.
- The maximum distance from the matrix switcher to the controlling device can be up to 200 feet (61 meters). Factors such as cable gauge, baud rates, environment, and output levels (from the switcher and the controlling device) all affect transmission distance. Distances of about 50 feet (15 meters) or less are typically not a problem. In some cases the matrix switcher may be capable of serial communications via RS-232 up to 250 feet (76 meters) away.

This port is RS-232 only, with its default protocols as follows:

- 9600 baud
- 1 stop bit
- no parity
- no flow control
- 8 data bits

Operation

This section describes the front panel operation of the FOX matrix switcher, including:

- **Front Panel Controls and Indicators**
- **Rear Panel Power Indicators**
- **Front Panel Operations**
- **Reset Operations**
- **Troubleshooting**
- **Configuration Worksheets**

Front Panel Controls and Indicators

The front panel controls (see figure 15, below, and **figure 16** on the next page) are grouped into two sets. The input and output buttons are grouped on the left side of the control panel. The control buttons are grouped on the right side of the panel.

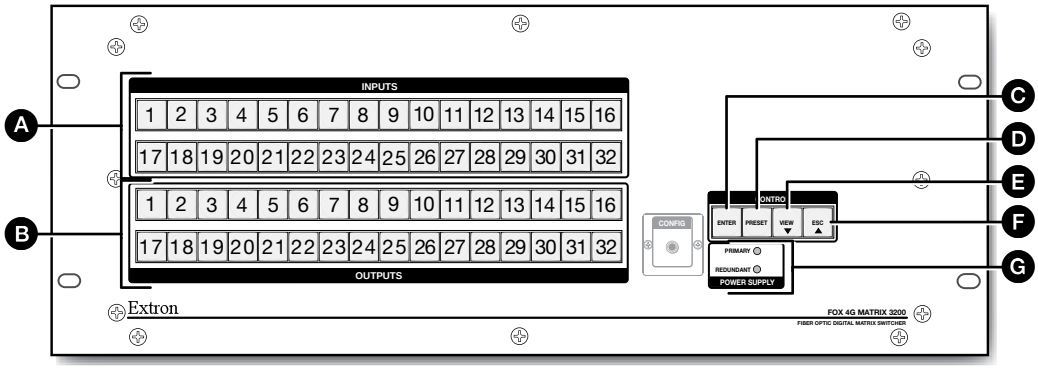


Figure 15. Front Panel, FOX Matrix 3200 Switcher

A **Input buttons** (see **page 20**).

B **Output buttons** (see **page 21**).

C **Enter button** (see **page 22**).

D **Preset button** (see **page 22**).

E **View button** (see **page 23**).

F **Esc button** (see **page 23**).

G **Primary and Redundant Power Supply LEDs** (see **page 23**).

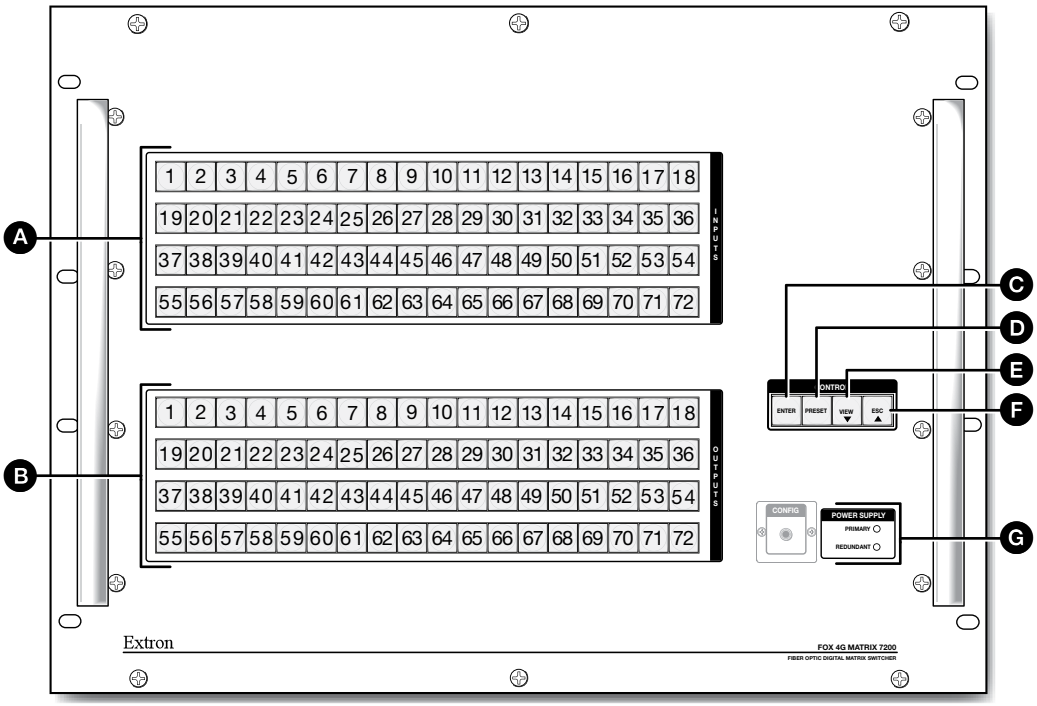


Figure 16. Front Panel, FOX Matrix 7200 Switcher

The illuminated pushbuttons on both switcher models can be labeled with either text or graphics. The buttons can be set to provide amber background illumination all the time or the background illumination can be turned off (see **Background illumination**, on page 42. The buttons blink or are lit at full intensity (depending on the operation) when selected.

- **A** **Input buttons** (see **page 20**).
- **B** **Output buttons** (see **page 21**).
- **C** **Enter button** (see **page 22**).
- **D** **Preset button** (see **page 22**).
- **E** **View button** (see **page 23**).
- **F** **Esc button** (see **page 23**).
- **G** **Primary and Redundant Power Supply LEDs** (see **page 23**).

Input and Output Buttons

NOTE: See **Front Panel Operations** on page 25 for detailed descriptions of the following operations.

Primary functions						
	Action	Select input or output for tie being created.				
	Indication	*Blink*: potential tie or untie. *Lit*: current tie				
FOX Matrix 3200		1	2	3 through	31	32
FOX Matrix 7200		1	2	3 through	71	72

Secondary functions					
I/O grouping	Action 1	Input 1 and Output 1: Select *I/O Group* mode.			
	Action 2	Assign an input or output to the selected group.			
	Indication	*Lit*: Input or output is assigned to the selected group.			
Presets	Action	Select a preset in *Preset* mode.			
	Indication	*Lit*: A preset has already been saved to this location. *Blink*: Preset location is selected to be saved.			
Output mutes	Action	***Output buttons***: Press and hold to mute or unmute the output.			
	Indication	***Output buttons*** *blinking*: Output is muted.			
Port configuration	Action			***Output 31 or 71:*** Select RS-232.	***Output 32 or 72:*** Select RS-422.
	Indication			***Blink:*** selected	***Blink***: selected
Background illumination	Action	***Input 1 and Input 2***: Toggle between background illumination or buttons unlit.			

Ⓐ **Input buttons** — The input buttons have one primary function (❑) and four secondary functions (•):

- ❑ Select and identify an input.
- • (**Input 1 only**) With the **`Output 1`** button, select I/O Group mode.
- • Assign an input to the selected group in I/O Group mode and indicate its assignment.
- • Select a preset.
- • (**Input 1 and Input 2 only**) Toggle background illumination of the buttons on and off.

Ⓑ **Output buttons** — The output buttons have one primary function (❑) and seven secondary functions (•):

❑ Select and identify an output.

- (**Output 1 only**) With the **`Input 1`** button, select I/O Group mode.
- Assign an output to the selected group in I/O Group mode and indicate its assignment.
- Select a preset.
- Mute the output.
- **Output 31 (FOX Matrix 3200) or Output 71 (FOX Matrix 7200**) — Select the RS-232 protocol for the RS-232/RS-422 port in Serial Port Selection and Configuration mode and indicate its selection.
- **Output 32 (FOX Matrix 3200) or Output 72 (FOX Matrix 7200**) — Select the RS-422 protocol for the RS-232/RS-422 port in Serial Port Selection and Configuration mode and indicate its selection.

Control Buttons

NOTE: See **Front Panel Operations** on page 25 for detailed descriptions of the following operations.

Primary functions					
	Action	Save changes	Select *Preset* mode	Select *View* mode	Cancel or Escape
	Indication	*Blink*: Save needed	*Blink*: Save preset *Lit*: Recall preset	View mode selected	Flashes once
Secondary functions					
I/O grouping	Action/ indication	Select and indicate group 1	Select and indicate group 2	Select and indicate group 3	Select and indicate group 4
Port configuration	Action 1	Select *Configuration* mode.			
	Action 2	Select 9600 baud	Select 19200 baud	Select 38400 baud	Select 115200 baud
	Indication	*Blink*: 9600 baud	*Blink*: 19200 baud	*Blink*: 38400 baud	*Blink*: 115200 baud
Front panel lock	Action	With Esc, toggle front panel lock on and off.			With Enter, toggle front panel lock on and off.
	Action		Flash twice to indicated the front panel has been locked or unlocked.		

C **Enter button** — The **Enter** button has two primary functions (❑) and three secondary functions (•):

- ❑ Saves configuration or preset changes that you make on the front panel. To create a simple configuration:
  - ❍ Press the desired input button (**item** ① on page 20).
  - ❍ Press the desired output button or buttons (**item** ② on page 22).
  - ❍ Press the **Enter** button.
- ❑ Indicates that a potential tie has been created but not saved.
- • In the *I/O Group* mode, selects group 1 and indicates the selection.
- • With the **Preset**, **View**, and **Esc** buttons, selects *Serial Port Selection and Configuration* mode.
- • With the **Esc** button, toggles the front panel lock on and off.

D **Preset button** — The **Preset** button has two primary functions (❑) and three secondary functions (•):

- ❑ Activates *Save Preset* mode to save a configuration as a preset and *Recall Preset* mode to activate a previously-defined preset.
- ❑ Blinks when *Save Preset* mode is active and lights steadily when *Recall Preset* mode is active.
- • In the *I/O Group* mode, selects group 2 and indicates the selection.
- • With the **Enter**, **View**, and **Esc** buttons, selects *Serial Port Selection and Configuration* mode.
- • Selects 19200 baud for the rear panel Remote port in *Serial Port Selection and Configuration* mode and indicates the selection.

E **View (▼) button** — The **View** (▼) button has one primary function (❑) and three secondary functions (•):

❑ Select and indicate View-only mode, which displays the current configuration.

> **NOTE:** View-only mode also provides a way to mute and unmute the outputs.

- In the *I/O Group* mode, selects group 3 and indicates the selection.
- With the **Enter**, **Preset**, and **Esc** buttons, selects *Serial Port Selection and Configuration* mode.
- Selects 38400 baud for the rear panel Remote port in *Serial Port Selection and Configuration* mode, and indicates the selection.

F **Esc (▲) button** — The **Esc** (▲) button has two primary functions (❑) and four secondary functions (•):

❑ Cancels operations or selections in progress and resets the front panel button indicators.

> **NOTE:** The **Esc** button does *not* reset the current configuration or any presets.

❑ Flashes once to indicate that the escape function has been activated.

- In the *I/O Group* mode, selects group 4 and indicates the selection.
- With the **Enter**, **Preset**, and **View** buttons, selects *Serial Port Selection and Configuration* mode.
- Selects 115200 baud for the rear panel Remote port in *Serial Port Selection and Configuration* mode and indicates the selection.
- With the **Enter** button, toggles the front panel lock on or off.

Power Indicators

G **Primary and Redundant Power Supply LEDs** —

Green — Indicates that the associated power supply is operating within normal tolerances.

Red — Indicates that the associated power supply is operating outside the normal tolerances or has failed. See **Removing and Installing a Power Supply Module** on page 113 to replace the power supply.

Button Icons

The numbered translucent covers on the input and output buttons can be removed and replaced to insert labels behind the covers.

Input and output labels can be created easily with the Extron Button Label Generator software, which is available on the Extron website (**www.extron.com**). Each input and output can be labeled with names, alphanumeric characters, or color bitmaps for easy and intuitive input and output selection (see figure 17). See the **Button Label Generator Program** on page 91 for details on using the labeling software and the **Removing and Installing Button Labels** on page 115 for blank labels and a procedure for removing and replacing the translucent covers.

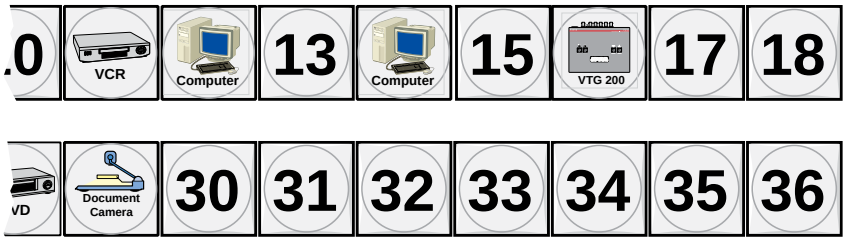


Figure 17. Sample Button Labels and Icons

Rear Panel Power Indicators

The two, primary and redundant, power supply modules (see figure 18) each have a 2-color LED.

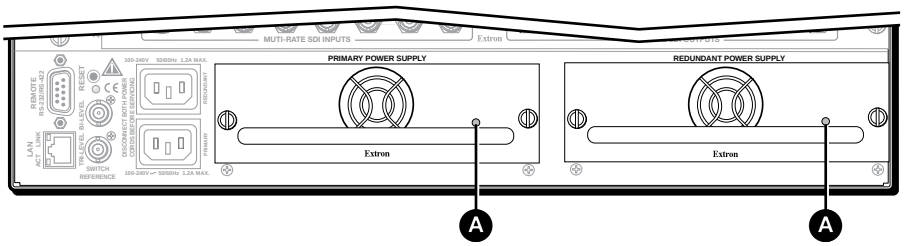


Figure 18. Rear Panel Power Supply Indicators

A Primary and Redundant Power Supply LEDs —

Green — Indicates that the associated power supply is operating within normal tolerances.

Red — Indicates that the associated power supply is operating outside the normal tolerances or has failed. See **Removing and Installing a Power Supply Module** on page 113 to replace the power supply.

Front Panel Operations

The following sections detail the power-up process and then provide sample procedures for the following actions:

- **Creating ties, sets of ties, and configurations**
- **Changing a configuration**
- **Viewing ties, sets of ties, and configurations**
- **Creating I/O groups**
- **Saving a preset**
- **Recalling a preset**
- **Muting and unmuting outputs**
- **Locking and unlocking the front panel**
- **Performing front panel resets**
- **Toggling background illumination on and off**
- **Reading and setting the Remote RS-232/RS-422 port settings**

Definitions

The following terms apply to Extron matrix switchers, and are used throughout this guide:

Tie — An input-to-output connection.

Set of ties — An input tied to two or more outputs. (An output can never be tied to more than one input.)

Configuration — May consist of one tie or one or more sets of ties.

Current configuration — The configuration that is currently being used (also called configuration 0).

Global memory preset — A configuration that has been stored. The FOX Matrix 3200 can store up to 32 global memory presets in memory and the FOX Matrix 7200 can store up to 64 presets. When a global preset is retrieved from memory, it becomes the current configuration.

Room — A Room consists of a smaller subset of virtual outputs that are logically related to each other, as determined by the operator. The switchers support up to 32 rooms, each of which consists of 1 to 16 virtual outputs.

Room memory preset — A configuration consisting of virtual outputs in a single room that has been stored. When a room preset is retrieved from memory, it becomes the current configuration. The switchers support up to 10 room presets per room. Selecting a room preset only changes the ties to outputs that are assigned to that room. All other ties outside the room are not affected.

Power

Apply power by connecting one or both power cords between the Primary and Redundant AC power connectors and the AC sources. The switcher performs a self-test that flashes the front panel button indicators various colors and then turns them either off or to background illumination. An error-free power-up self-test sequence leaves all input, output, and control buttons either unlit or showing background illumination.

The current configuration and all presets are saved in non-volatile memory. When power is applied, the most recent configuration is retrieved. The previous presets remain intact.

If an error occurs during the self-test, the switcher locks up and fails to respond to commands or button pushes. If your switcher locks up on power-up, call the Extron S3 Sales and Technical Support Hotline. See the **end** of this guide for the phone number in your region of the world.

Creating a Configuration

The current configuration can be changed using the front panel buttons. Change the current configuration as follows:

1. Press the **Esc** button to clear any front panel button indications that may be lit.
2. Select the desired input and output(s) by pressing the input and output buttons.
   - To indicate potential ties, output buttons blink when an input is selected.
   - To indicate current ties, output buttons light steadily when an input is selected.
   - To clear unwanted outputs, press and release the associated lit output buttons. To indicate potential unties, output buttons blink when an output is deselected but not untied from the input.
3. Press and release the **Enter** button to accept the tie or to break an existing tie.
4. Repeat steps 1 through 3 to create or clear additional ties until the desired configuration is complete.

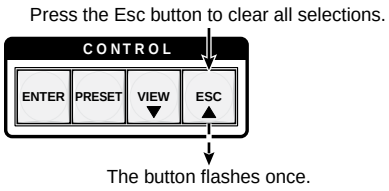
NOTES:

- Only one input can be tied to an output.
- If a tie is made between an input and an output, and the selected output was previously tied to another input, the older tie is broken in favor of the newer tie.
- If an input with no tie is selected, only the button for the selected input lights.
- As each input and output is selected, the associated output button blinks to indicate a tentative tie. Buttons for outputs that were already tied to the input light steadily. Outputs that are already tied can be left on, along with new blinking selections, or toggled off by pressing the associated output button.
- If you press the input button for an input that is I/O grouped (see **I/O grouping** on page 33) and then try to select an output in a different group, you cannot select the associated output button. The associated input button remains lit.
- An optical input can be tied to one or more of both the optical and SDI/HD-SDI outputs, and an SDI/HD-SDI input can be tied to one or more of both the SDI/HD-SDI and optical outputs.

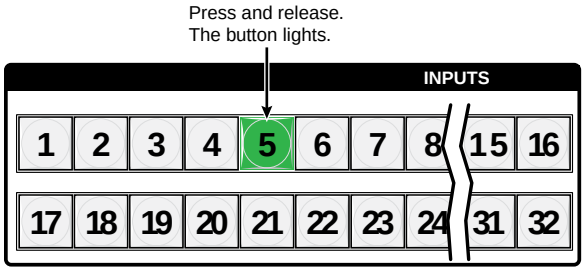
Example 1: Create a set of ties

In the following example, input 5 is tied to outputs 3, 4, and 8. The steps show the front panel indications that result from your actions.

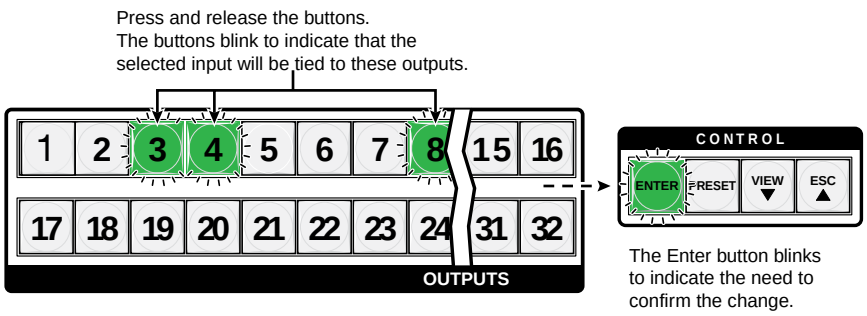
1. **Clear all selections**: Press and release the **Esc** button.



2. **Select an input**: Press and release the **Input 5** button.

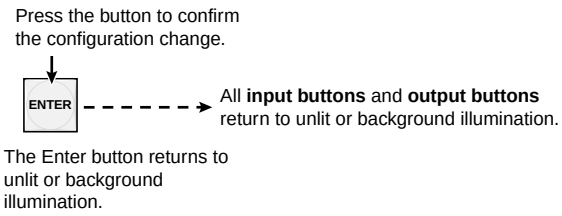


3. **Select the outputs**: Press and release the output 3, output 4, and output 8 buttons.


Press and release the buttons.
The buttons blink to indicate that the
selected input will be tied to these outputs.
1 2 3 4 5 6 7 8 15 16
17 18 19 20 21 22 23 24 31 32
OUTPUTS
CONTROL
ENTER
PRESET
VIEW
ESC
The Enter button blinks
to indicate the need to
confirm the change.

> **NOTE:** You can cancel the entire set of ties at this point by pressing and releasing the **Esc** button. The **Esc** button flashes once.

4. **Confirm the change**: Press and release the **Enter** button.



The current configuration (see figure 19) is now input 5 tied to output 3, output 4, and output 8.

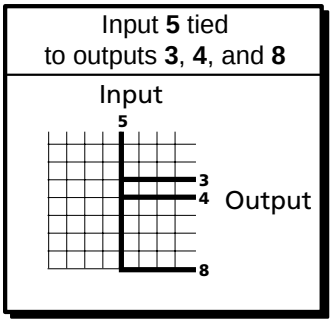


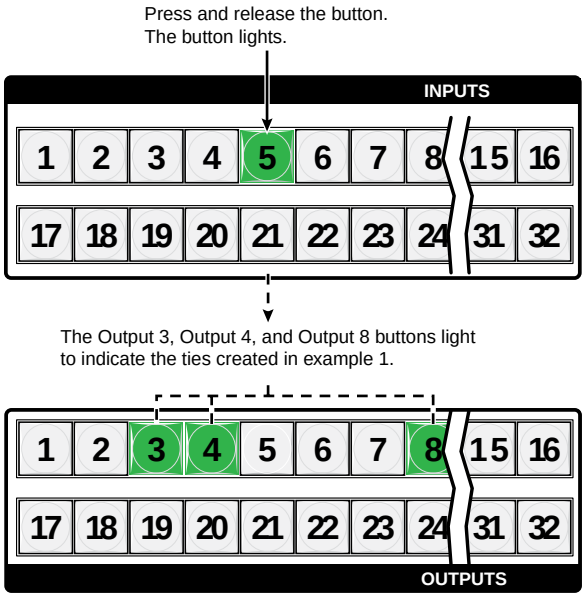
Figure 19. Final Configuration, Example 1

Example 2: Add a tie to a set of ties

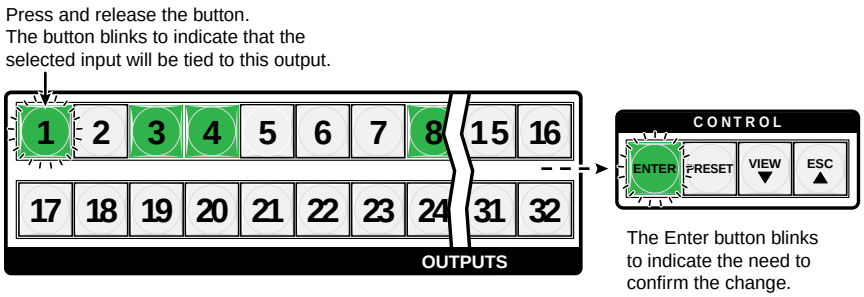
In the following example, a new tie is added to the current configuration. The example shows the front panel indications that result from your actions.

NOTE: This example assumes that you have performed **example 1** on the previous page.

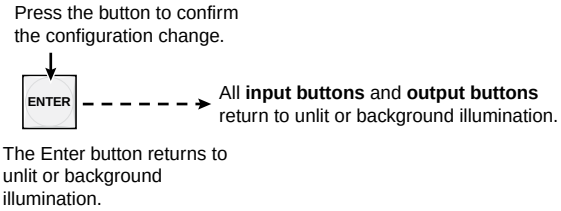
1. **Clear all selections**: Press and release the **`Esc`** button.
2. **Select an input**: Press and release the **`Input 5`** button.


Press and release the button.
The button lights.
INPUTS
1 2 3 4 5 6 7 8 15 16
17 18 19 20 21 22 23 24 31 32
The Output 3, Output 4, and Output 8 buttons light
to indicate the ties created in example 1.
1 2 3 4 5 6 7 8 15 16
17 18 19 20 21 22 23 24 31 32
OUTPUTS

3. **Select the output**: Press and release the **`Output 1`** button.


Press and release the button.
The button blinks to indicate that the
selected input will be tied to this output.
1 2 3 4 5 6 7 8 15 16
17 18 19 20 21 22 23 24 31 32
OUTPUTS
CONTROL
ENTER
PRESET
VIEW
ESC
The Enter button blinks
to indicate the need to
confirm the change.

4. **Confirm the change**: Press and release the **Enter** button.



The current configuration (see figure 20) is now input 5 tied to output 1, output 3, output 4, and output 8.

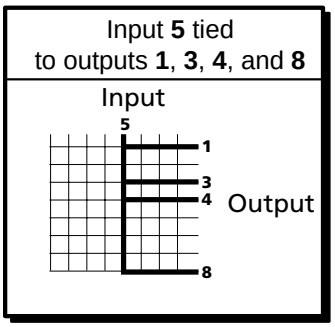


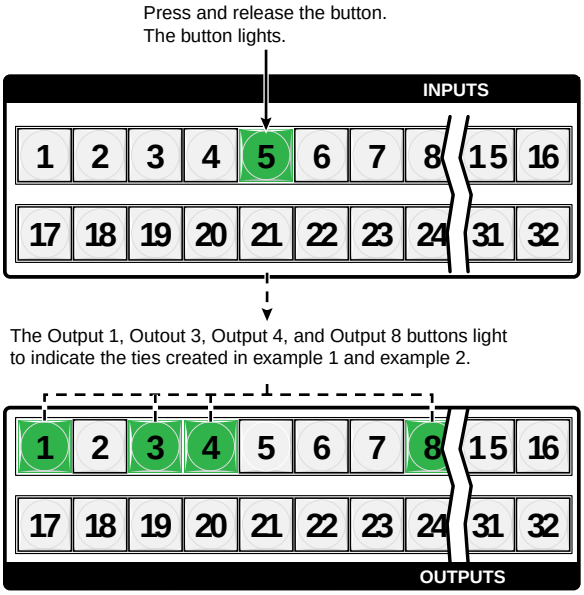
Figure 20. Final Configuration, Example 2

Example 3: Remove a tie from a set of ties

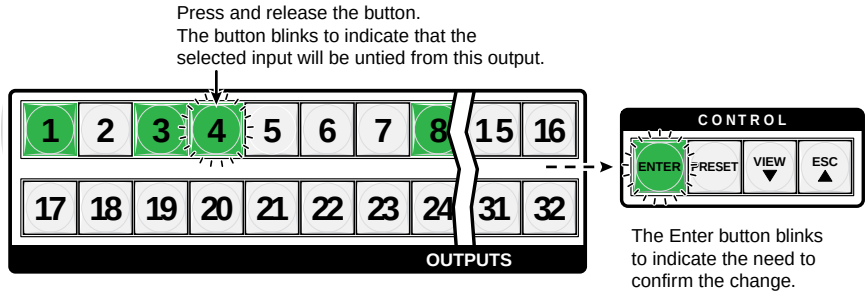
In the following example, an existing tie is removed from the current configuration. The example shows the front panel indications that result from your actions.

NOTE: This example assumes that you have performed **example 1** on page 27 and **example 2** on the previous page.

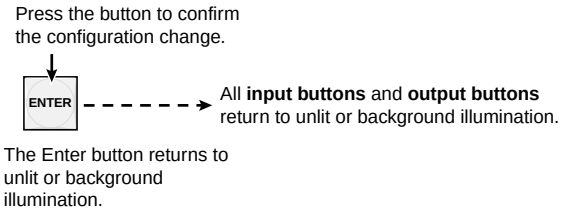
1. **Clear all selections**: Press and release the **Esc** button.
2. **Select an input**: Press and release the input 5 button.


Press and release the button.
The button lights.
INPUTS
1 2 3 4 5 6 7 8 15 16
17 18 19 20 21 22 23 24 31 32
The Output 1, Outout 3, Output 4, and Output 8 buttons light
to indicate the ties created in example 1 and example 2.
1 2 3 4 5 6 7 8 15 16
17 18 19 20 21 22 23 24 31 32
OUTPUTS

3. **Select the output**: Press and release the **`Output 4`** button.



4. **Confirm the change**: Press and release the **`Enter`** button.


Press the button to confirm the configuration change.
ENTER
All **input buttons** and **output buttons** return to unlit or background illumination.
The Enter button returns to unlit or background illumination.

The current configuration (see figure 21) is now input 5 video is tied to output 1, output 3, and output 8.

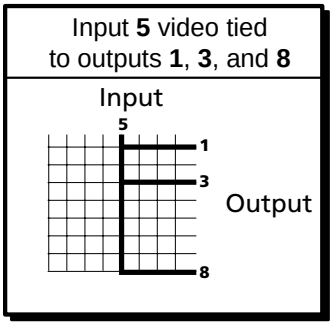


Figure 21. Final Configuration, Example 3

Viewing the Configuration

The current configuration can be viewed using the front panel buttons. The *View-only* mode prevents inadvertent changes to the current configuration. *View-only* mode also provides a way to mute outputs (see **Muting and Unmuting Outputs** on page 39).

View the current configuration as follows:

1. Press the **Esc** button to clear any front panel button indications that may be lit.
2. Press and release the **View** button. All of the buttons light for outputs that are **not** tied.
3. Select the desired input or output whose ties you wish to view by pressing the input or output buttons.

NOTES:

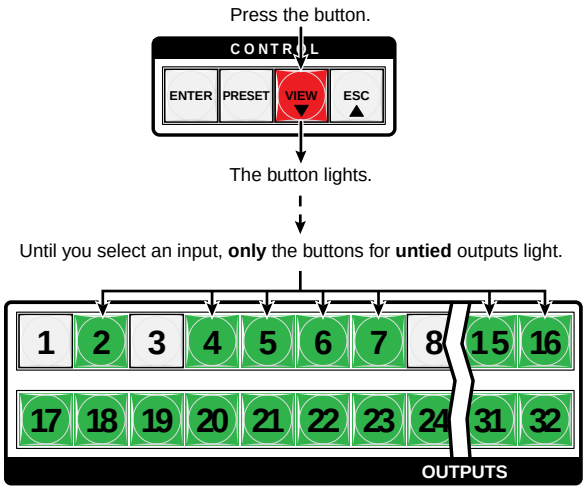
- When you enter *View-only* mode, the output buttons light for all outputs without ties. Likewise, when you press an output button for which there are no ties, the output buttons light for all outputs without ties.
- To see all ties of the current configuration, press and release each input and output button, one at a time.
- After 30 seconds of front panel inactivity, *View-only* mode automatically deselects.

Example 4: Viewing ties

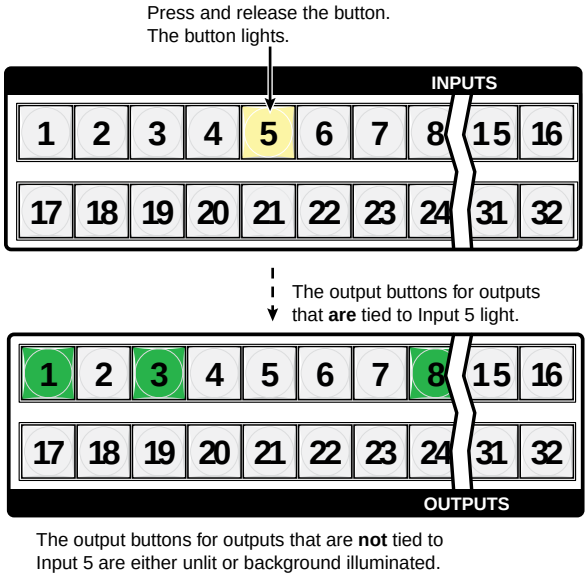
In the following example, we view the ties in the current configuration. The steps show the front panel indications that result from your actions.

NOTE: This example assumes that you have performed **example 1** on page 27, **example 2** on page 28, and **example 3** on page 29.

1. **Clear all selections**: Press and release the **Esc** button.
2. **Select *View-only* mode**: Press and release the **View** button. The **View** button lights.



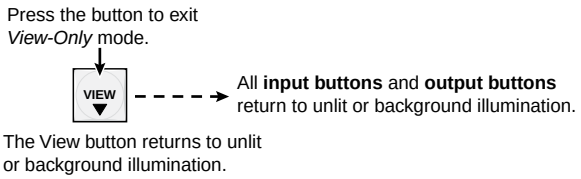
3. **Select an input**: Press and release the **`Input 5`** button.


Press and release the button.
The button lights.
INPUTS
1 2 3 4 5 6 7 8 15 16
17 18 19 20 21 22 23 24 31 32
The output buttons for outputs that are tied to Input 5 light.
1 2 3 4 5 6 7 8 15 16
17 18 19 20 21 22 23 24 31 32
OUTPUTS
The output buttons for outputs that are not tied to Input 5 are either unlit or background illuminated.

NOTE: You can also view a set of ties by selecting a tied output. Demonstrate this as follows:

- Note the number of a lit output button.
- Then press and release the output button for an untied (unlit or background illumination) output.
- Observe that all of the untied outputs light.
- Then press the output button that you noted previously.
- Observe that the selected output button, the tied input button (input 5), and the output buttons light for all of the outputs that are tied to the input.

4. **Exit *View-only* mode**: Press and release the **`View`** button


Press the button to exit View-Only mode.
VIEW
All input buttons and output buttons return to unlit or background illumination.
The View button returns to unlit or background illumination.

I/O Grouping

I/O grouping (see figure 22) is a matrix switcher feature that allows you to subdivide the front panel controls of the matrix into four smaller functional sub-switchers and limit tie creation **using the front panel only**. Inputs and outputs can be assigned to one of four groups or not assigned to any group.

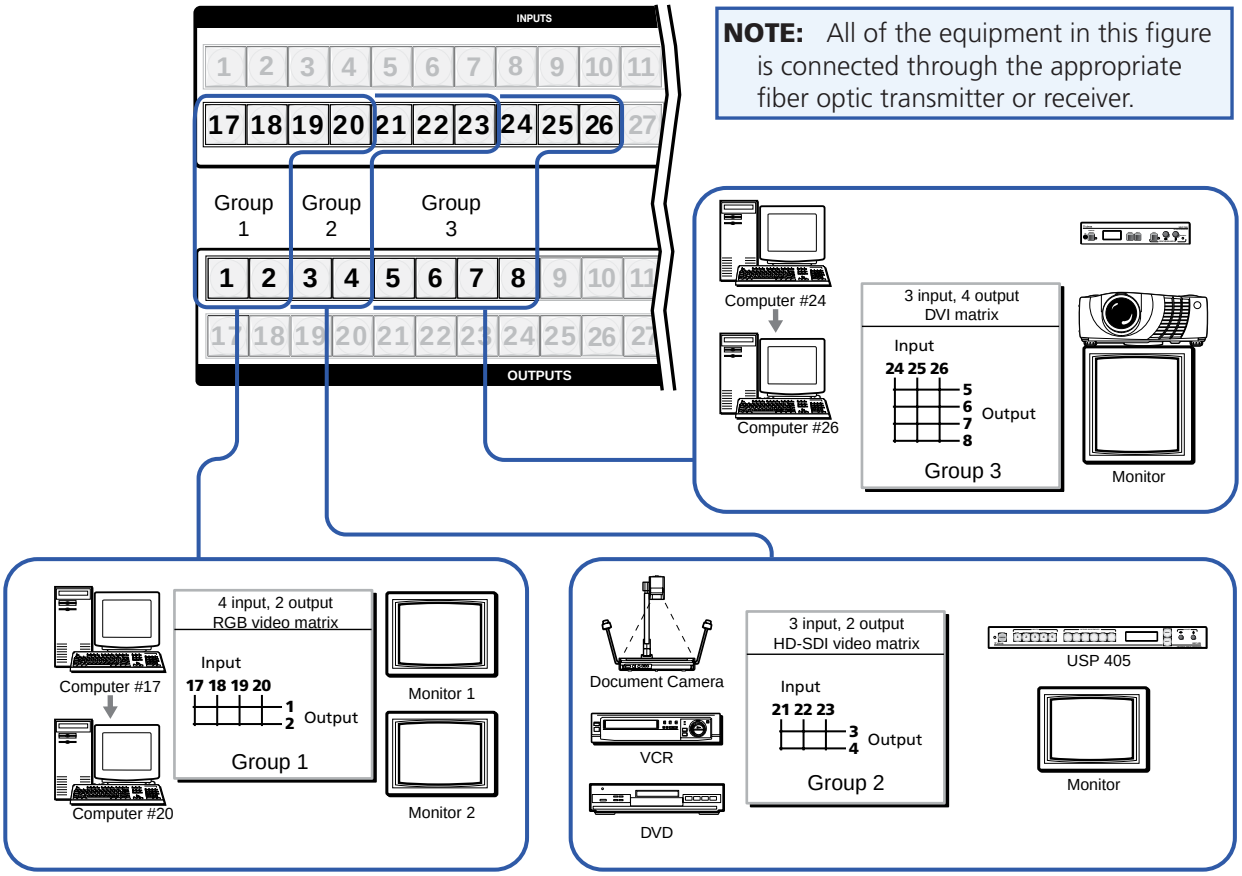


Figure 22. I/O Grouping of Incompatible Video Formats

NOTE: The I/O grouping feature is tied into the Switch Reference connectors on the switcher. Ties to any input in I/O group 1 use the tri-level sync reference. Ties to any output in I/O group 2 use the bi-level sync reference. Assign sync-critical inputs and outputs to the appropriate I/O groups.

When you are creating ties on the front panel, inputs and outputs that are assigned to a group can be tied only to other outputs and inputs within the same group. For example, a front panel operator cannot tie an input that is assigned to group 1 to an output that is assigned to group 2. Ungrouped inputs and outputs can be switched to outputs and inputs in any group. Ties between groups (an input in group 1 tied to an output in group 2) **can** be created under serial port or Ethernet control.

Suggested applications for the I/O grouping feature include:

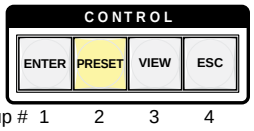
- Segregating sync-critical inputs and outputs
- Segregating specific video formats to prevent an input in one video format from being inadvertently applied to an output device that supports another video format
- Segregating input and output devices that are in separate rooms
- Segregating incompatible fiber signals, such as those from a FOX 500 system and those from a FOX HD-SDI system
- Isolating video from being displayed on specific output devices for operational security reasons

The I/O groups can be set up on the front panel or by using the Remote port, Configuration port, or LAN ports and either the SIS (see the **Programming Guide** section, beginning on page 52) or the Matrix Switchers Control Program (see the **Matrix Software** section, beginning on page 71).

Create I/O groups on the front panel as follows:

NOTE: I/O groups are protected when front panel Lock mode 2 is selected. You can view the groups in Lock mode 2, but you cannot change them from the front panel (see **Locking the Front Panel (Executive Mode)** on page 41).

1. Press the **Esc** button to clear any front panel button indications that may be lit.
2. To enter *I/O Group* mode, press and **hold** the **Input 1** and **Output 1** buttons until the input and output buttons light to display the ungrouped inputs and outputs.
3. Press and release one of the Control buttons to select a group:
   - Press the **Enter** button to select group 1.
   - Press the **Preset** button to select group 2.
   - Press the **View** button to select group 3.
   - Press the **Esc** button to select group 4.



4. Select the one or more inputs and one or more outputs to assign to the group by pressing the input and output buttons.
5. Allow the *I/O Group* mode to time out after approximately 30 seconds.

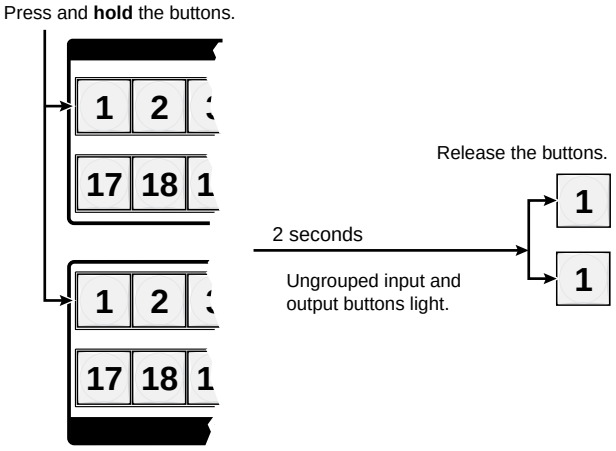
NOTES:

- Ties between groups (an input in group 1 tied to an output in group 2) can be created under serial port or Ethernet control.
- Ties that were created before I/O groups were created remain valid, even if they include inputs and outputs in different groups.
- Presets can be created under serial port or Ethernet control that tie inputs and outputs across group boundaries. These presets are selectable from the front panel.
- An input or output can be assigned to only one group. If you assign an input or output to a group and that input or output is already assigned to a different group, the older grouping is disboarded in favor of the new grouping.
- For I/O groups to have any function, at least two groups must be created.

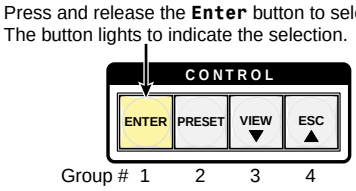
Example 5: Grouping inputs and outputs

In the following example, several switcher inputs and outputs are assigned to groups. The steps show the front panel indications that result from your actions.

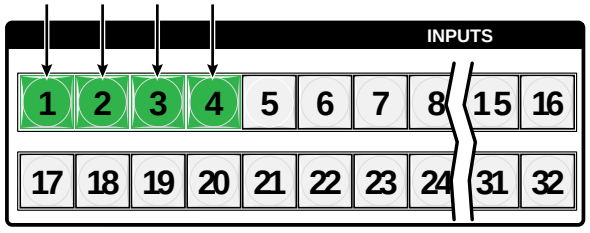
1. **Clear all selections**: Press and release the **`Esc`** button.
2. **Enter *I/O Group* mode**: Simultaneously press and **hold** the **`Input 1`** and **`Output 1`** buttons for approximately 2 seconds and then release the buttons.



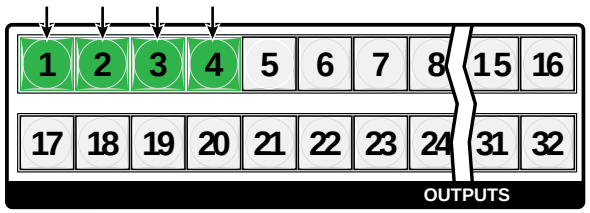
3. **Select group 1**: Press and release the **`Enter`** button.



4. **Assign inputs and outputs to group 1**:
   a. Press and release the **`Input 1`** through **`Input 4`** buttons.

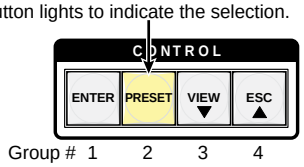


   b. Press and release the **`Output 1`** through **`Output 4`** buttons.



5. **Select group 2**: Press and release the **Preset** button.

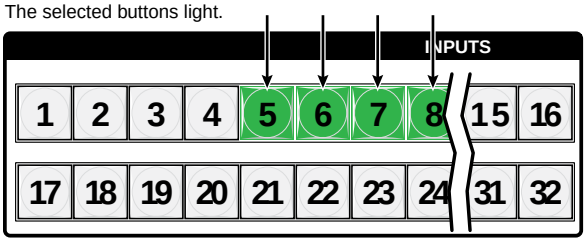
Press and release the **Preset** button to select group 2.
The button lights to indicate the selection.



6. **Assign inputs and outputs to group 2**:

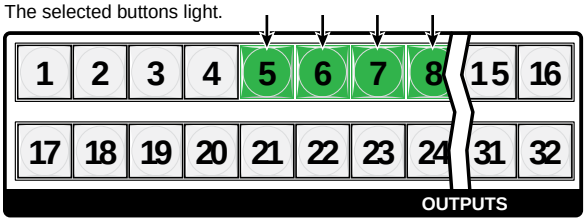
   a. Press and release the **Input 5** through **Input 8** buttons.

One at a time, press and release the buttons.
The selected buttons light.



   b. Press and release the **Output 5** through **Output 8** buttons.

One at a time, press and release the buttons.
The selected buttons light.



7. Do nothing for approximately 30 seconds. The switcher exits *I/O Group* mode.

   In this example:

   - Group 1 consists of inputs 1 through 4 and outputs 1 through 4.
   - Group 2 consists of inputs 5 through 8 and outputs 5 through 8.

Using Presets

The current configuration (configuration 0) can be saved as a preset in any one of 32 (FOX Matrix 3200) or 64 (FOX Matrix 7200) preset memory addresses. Presets can be saved and recalled from the front panel. The preset locations are assigned to input buttons 1 through 32 (64). When a preset is retrieved from memory, it becomes the current configuration.

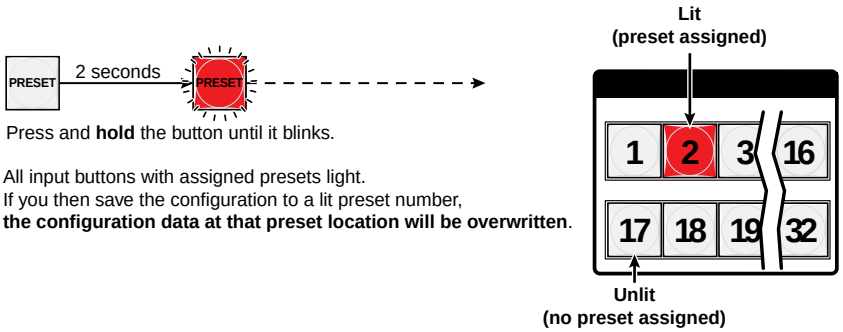
NOTES:

- Presets **cannot** be viewed from the front panel unless they are recalled as the current configuration. Presets **can** be viewed using the Extron matrix switchers Control Program (see the **Presets menu** description in the "Matrix Software" section on page 85).
- The current configuration and all presets are stored in non-volatile memory. When power is removed and restored, the current configuration is still active and all presets are retained.
- When a preset is recalled, it replaces the current configuration, which is lost unless it is also stored as a preset. The recalled preset overwrites all of the current configuration ties in favor of the preset configuration ties.

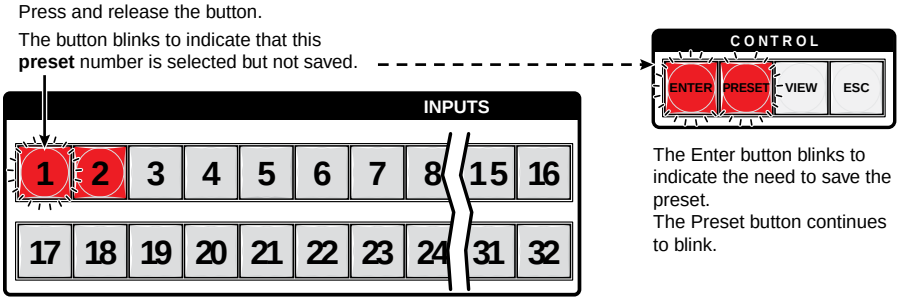
Example 6: Saving a preset

In the following an example, the current configuration is saved as a preset. The example shows the front panel indications that result from your actions.

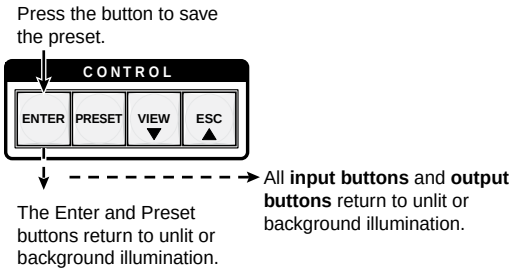
1. **Clear all selections**: Press and release the **Esc** button.
2. **Select *Save Preset* mode**: Press and **hold** the **Preset** button for approximately 2 seconds until it blinks.



3. **Select the preset**: Press and release the input button or output button for the desired preset.



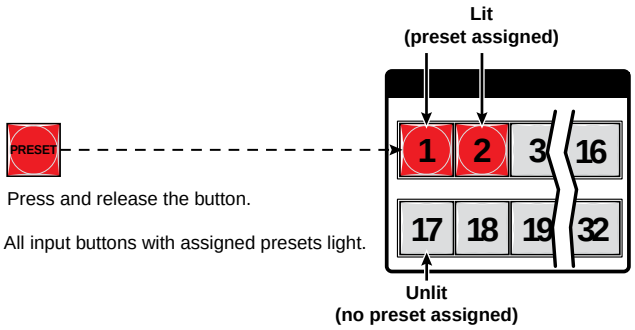
4. **Save the Preset**: Press and release the **Enter** button to save the preset. The current configuration is now stored in the selected memory location.


Press the button to save the preset.
CONTROL
ENTER
PRESET
VIEW
ESC
All input buttons and output buttons return to unlit or background illumination.
The Enter and Preset buttons return to unlit or background illumination.

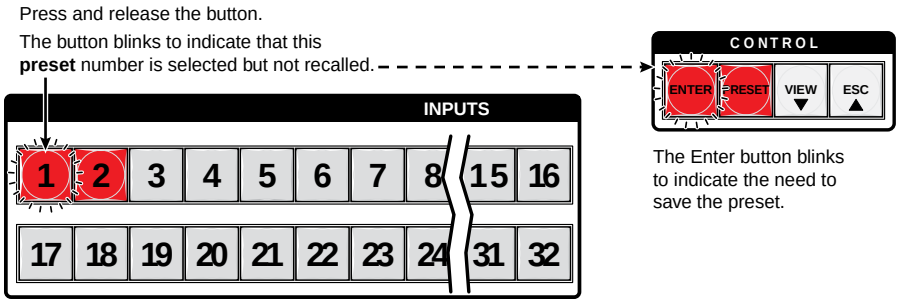
Example 7: Recalling a preset

In the following example, a preset is recalled to become the current configuration. The steps show the front panel indications that result from your actions.

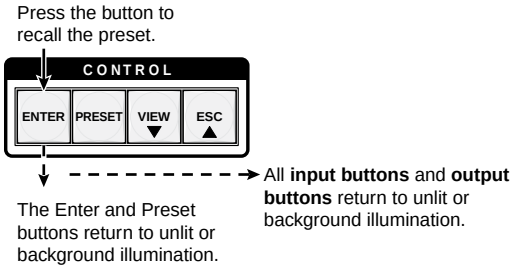
1. **Clear all selections**: Press and release the **Esc** button.
2. **Select *Recall Preset* mode**: Press and release the **Preset** button.



3. **Select the preset**: Press and release the input button or output button for the desired preset.



4. **Recall the preset**: Press and release the **Enter** button. The configuration stored in the selected memory location is now the current configuration and can be viewed in the *View-only* mode (see **example 4** on page 31).


Press the button to recall the preset.
CONTROL
ENTER
PRESET
VIEW
ESC
All input buttons and output buttons return to unlit or background illumination.
The Enter and Preset buttons return to unlit or background illumination.

Muting and Unmuting Outputs

Individual outputs can be muted or unmuted as follows:

NOTE: Output mutes are protected when front panel Lock mode 2 is selected. You can view the status of the output (muted or unmuted) in Lock mode 2 but you cannot change it from the front panel (see **Locking the Front Panel (Executive Mode)** on page 41).

1. Press the **Esc** button to clear any front panel button indications that may be lit.
2. Press and release the **View** button.
3. One at a time, press and **hold** the button for the desired output for approximately 2 seconds. The output button for the selected output blink to indicate the mute or return to their previous state to indicate the unmute.
4. Press and release the **View** button to return to normal switcher operation.

NOTES:

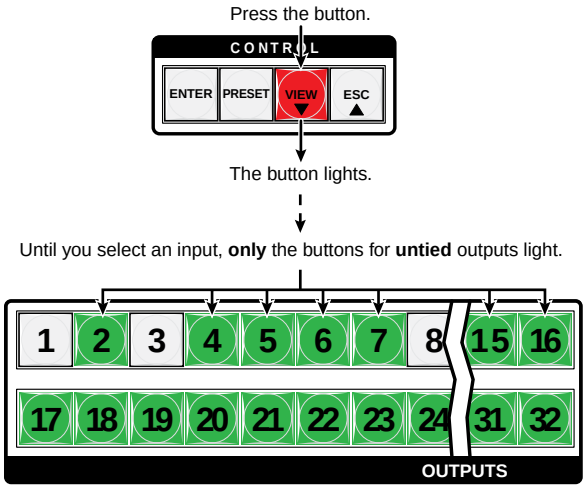
- When you enter *View-only* mode, the output LEDs turn **on** for all outputs **without** ties.
- Mutes are saved to non-volatile memory. When power is removed and restored, the mute settings are retained.

Example 8: Muting and unmuting an output

In the following example, a switcher output is muted and unmuted. The steps show the front panel indications that result from your actions.

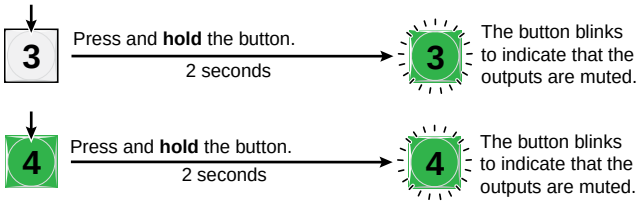
NOTE: This example assumes that you have performed **example 1** on page 27, **example 2** on page 28, and **example 3** on page 29.

1. **Clear all selections**: Press and release the **Esc** button.
2. **Select *View-only* mode**: Press and release the **View** button. The **View** button lights.



3. **Mute the outputs: One at a time**, press and **hold** the **Output 3** button and then the **Output 4** button for approximately 2 seconds until each button begins to blink. The output 3 and output 4 signals are muted.

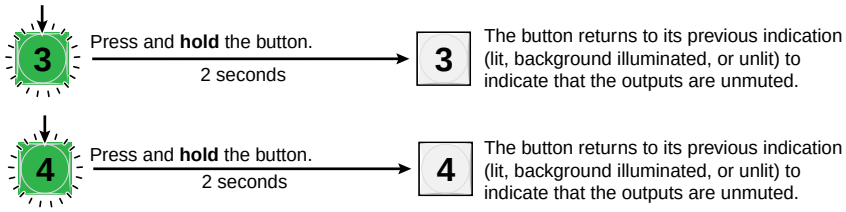
Mute outputs one at a time.



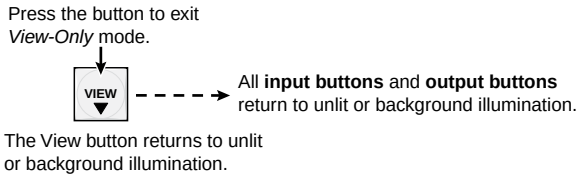
NOTE: When you push Input 3, it lights and Input 4 returns to unlit because of ties made in **example 1** on page 27, **example 2** on page 28, and **example 3** on page 29.

4. **Unmute the outputs: One at a time**, press and **hold** the **Output 3** button and then the **Output 4** buttons for approximately 2 seconds until each button lights steadily. The output 3 and output 4 signals are unmuted.

Unmute outputs one at a time.


3
Press and hold the button.
2 seconds
3
The button returns to its previous indication (lit, background illuminated, or unlit) to indicate that the outputs are unmuted.
4
Press and hold the button.
2 seconds
4
The button returns to its previous indication (lit, background illuminated, or unlit) to indicate that the outputs are unmuted.

5. **Exit *View-only* mode**: Press and release the **View** button.


Press the button to exit View-Only mode.
VIEW
All input buttons and output buttons return to unlit or background illumination.
The View button returns to unlit or background illumination.

Locking the Front Panel (*Executive* Mode)

The front panel security lockout limits the operation of the switcher from the front panel. When the switcher is locked, all of the front panel functions are disabled except for the *View-Only* mode functions and deselecting the front panel *Lock* mode (see **Viewing the Configuration** on page 31). Other than in *View-Only* mode, if the user pushes a front panel button when the switcher is locked, the **`View`** and **`Preset`** buttons flash twice and return to their previous state.

To toggle the lock on and off, press and hold the **`Enter`** button and the **`Esc`** button for approximately two seconds (see figure 23).

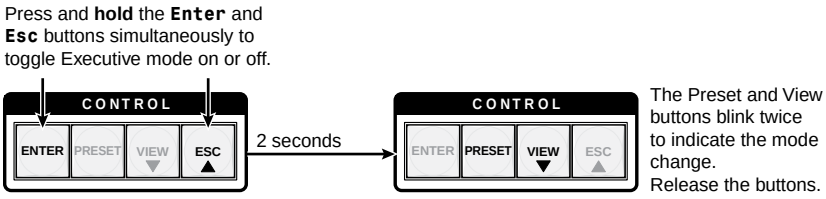


Figure 23. Toggling Front Panel Lock On and Off

Performing a System Reset from the Front Panel

The front panel reset is identical to issuing the Esc Z X X X ← SIS command (see page 64). A system reset clears all ties and presets and resets all I/O grouping.

NOTES:

- You must apply power from an unpowered state. Applying the redundant power with primary power already applied does **not** reset the switcher.
- System reset does not reset the Internet protocol (IP) settings or replace user-installed firmware.

Reset the switcher to the factory default settings by pressing and **holding** the **`View`** button and **`Esc`** button simultaneously **while** you apply AC power to the switcher (see figure 24).

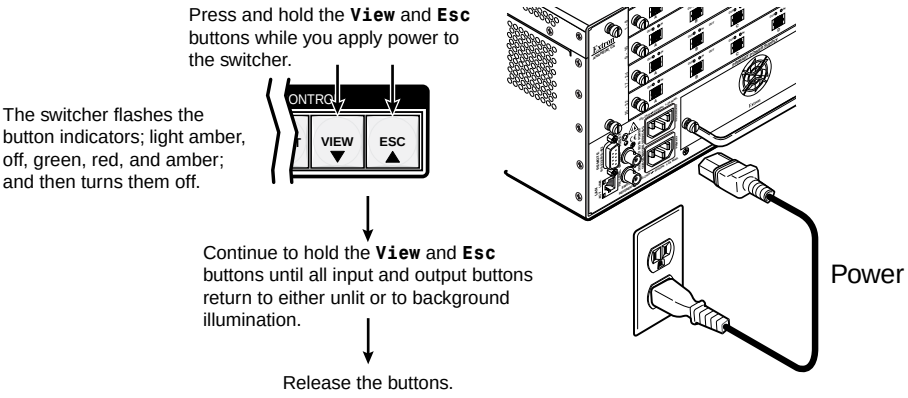

Press and hold the View and Esc buttons while you apply power to the switcher.
The switcher flashes the button indicators; light amber, off, green, red, and amber; and then turns them off.
VIEW
ESC
Continue to hold the View and Esc buttons until all input and output buttons return to either unlit or to background illumination.
Release the buttons.
Power

Figure 24. System Reset

NOTE: If background illumination was turned on before the reset, the I/O and control buttons are unlit after the reset. But, when you cycle power, background illumination returns to as selected.

Background Illumination

The buttons on the front panel can be set to provide amber background illumination at all times or the background illumination can be turned off. To toggle the background illumination on or off, press and hold the **Input 1** and **Input 2** buttons simultaneously for approximately 2 seconds (see figure 25).

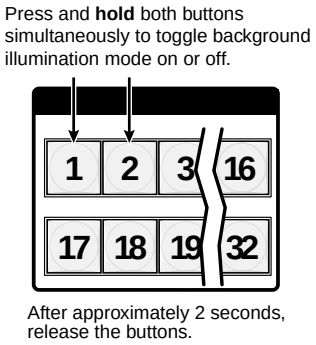


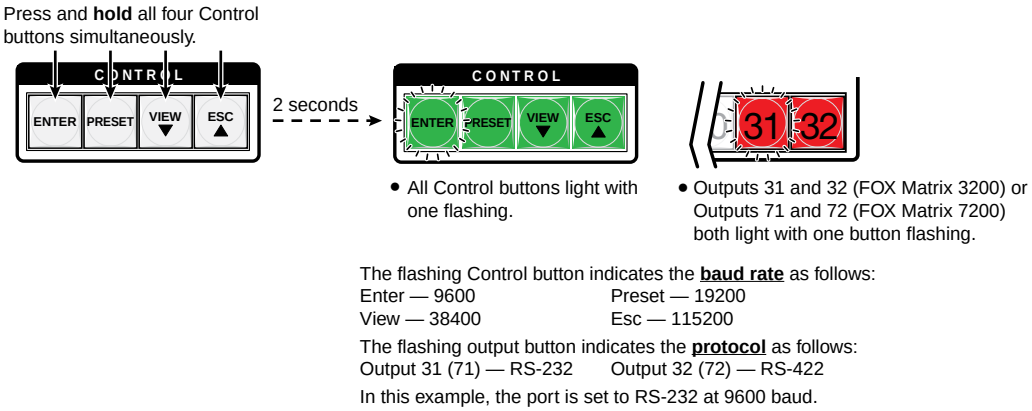
Figure 25. Toggle Background Illumination On or Off

Selecting the Rear Panel Remote Port Protocol and Baud Rate

All switchers can support either RS-232 or RS-422 serial communication protocol and can operate at the 9600, 19200, 38400, and 115200 baud rate. The settings of these variables can be viewed and changed from the front panel.

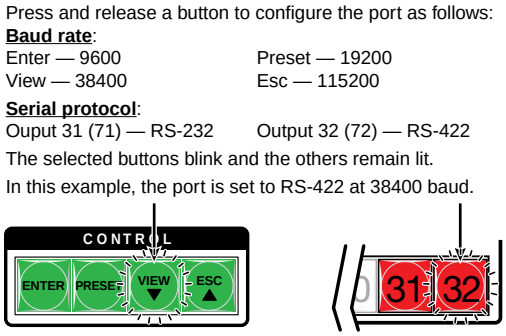
View and configure the serial communications settings as follows:

1. **Select *Serial Port Selection and Configuration* mode**: Simultaneously press and **hold all** Control buttons (**Enter**, **Preset**, **View**, and **Esc**).

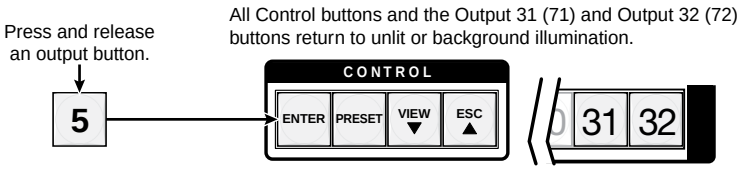

Press and **hold** all four Control buttons simultaneously.
CONTROL
ENTER
PRESET
VIEW
ESC
2 seconds
CONTROL
ENTER
PRESET
VIEW
ESC
31
32
• All Control buttons light with one flashing.
• Outputs 31 and 32 (FOX Matrix 3200) or Outputs 71 and 72 (FOX Matrix 7200) both light with one button flashing.
The flashing Control button indicates the **baud rate** as follows:
Enter — 9600
Preset — 19200
View — 38400
Esc — 115200
The flashing output button indicates the **protocol** as follows:
Output 31 (71) — RS-232
Output 32 (72) — RS-422
In this example, the port is set to RS-232 at 9600 baud.

2. Release the Control buttons.

3. **Change a value**: Press and release the button that relates to the desired value.



4. **Exit the *Serial Port Selection and Configuration* mode**: Press and release an output button.



Reset Operations

The rear panel has a Reset button that initiates four levels of resets (numbered 1, 3, 4, and 5 for the sake of comparison with an Extron IPL product). The Reset button is recessed, so use a small screwdriver, a pointed stylus, or a ballpoint pen.

For different reset levels, press and hold the button while the switcher is running or press and hold the button while you apply power to the switcher.

See the **table** on the next page for a summary of the modes.

ATTENTION:

- Review the reset modes carefully. Using the wrong reset mode may result in unintended loss of flash memory programming, port reassignment, or a controller reboot.
- Étudier de près les différents modes de réinitialisation. Appliquer le mauvais mode de réinitialisation peut causer une perte inattendue de la programmation de la mémoire flash, une reconfiguration des ports ou une réinitialisation du contrôleur.

NOTE: The reset modes listed on the next page close all open IP and Telnet connections and close all sockets. Also, the following modes are separate functions, not a continuation from Mode 1 to Mode 5.

Mode	Activation	Result	Purpose and Notes
1	Hold down the recessed **Reset** button while applying power to the switcher. **NOTE:** After a mode 1 reset is performed, update the switcher firmware to the latest version. Do not operate the switcher firmware version that results from the mode 1 reset. If you want to use the factory default firmware, you must upload that version again (see the **Matrix Software** section on page 80 for details on uploading firmware).	**The switcher reverts to the factory default firmware**. Event scripting will not start if the switcher is powered on in this mode. All user files and settings (such as drivers, adjustments, and IP settings) are maintained. **NOTE:** If you do not want to update firmware, or you performed a mode 1 reset by mistake, cycle power to the switcher to return to the firmware version that was running before the mode 1 reset. Use the **0Q** SIS command (see page 65) to confirm that the factory default firmware is no longer running (look for the asterisk [*] following the version number.	Use mode 1 to revert to the factory default firmware version if incompatibility issues arise with user-loaded firmware.
3	Hold down the **Reset** button for about 3 seconds, until the Reset LED blinks once, then press and release **Reset** within 1 second.	**Mode 3 turns events on or off**. During resetting, the Reset LED flashes 2 times if events are starting, 3 times if events are stopping.	Mode 3 is useful for troubleshooting.
4	Hold down the **Reset** button for about 6 seconds, until the Reset LED blinks twice (once at 3 seconds and again at 6 seconds). Then press and release **Reset** within 1 second.	**Mode 4**: • Enables ARP capability. • Sets the IP address to the factory default. • Sets the subnet address to the factory default. • Sets the gateway address to the factory default. • Sets port mapping to the factory default. • Turns DHCP off. • Turn events off. The Reset LED flashes four times in quick succession during the reset.	Mode 4 enables you to set IP address information using ARP and the MAC address.
5	Hold down the **Reset** button for about 9 seconds, until the Reset LED blinks three times (once at 3 seconds, again at 6 seconds, and then again at 9 seconds). Then press and release **Reset** within 1 second. **NOTE:** Mode 5 reset clears most adjustments. To save these settings, use the Windows-based Matrix Switchers Control Program and the **File** > **Save MATRIX settings as...** selection before you perform this reset (see the **Matrix Software** section on page 85).	**Mode 5 performs a complete reset to factory defaults (with the exception of the firmware)**: • Does everything mode 4 does. • Resets most all real time adjustments, including: clears all ties and presets clears all mutes clears all I/O grouping • Resets all IP options. • Removes and clears all files for the switcher. The reset LED flashes four times in quick succession during the reset.	Mode 5 is useful if you want to start over with configuration and uploading or to replace events. Same as Esc **ZQQQ**← SIS command (see page 64).

Performing Soft System Resets (Resets 3, 4, and 5)

Perform a soft reset of the switcher as follows:

1. Use an Extron Tweeker or other small screwdriver to press and **hold** the rear panel **Reset** button until the front panel **View** and **Esc** buttons blink the number of times for the desired reset: once (events reset), twice (system reset), or three times (absolute reset) (see figure 26).

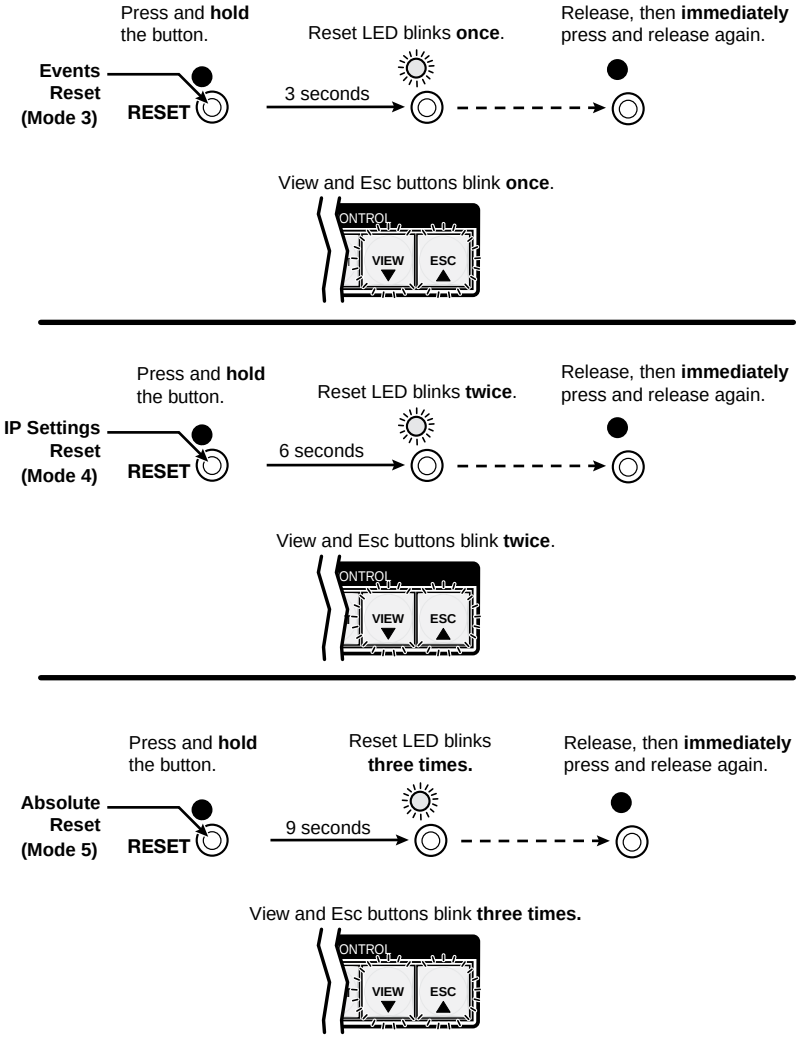


Figure 26. Soft System Resets

2. Release the **Reset** button and then immediately press and release the **Reset** button again. Nothing happens if the second momentary press does not occur within 1 second.

Performing a Hard Reset (Reset 1)

The hard reset function restores the switcher to the base firmware that it was shipped with. After a hard reset, events do not automatically start, but user settings and files are restored.

Perform a hard reset as follows:

NOTE: The hard reset restores the factory-installed firmware. The switcher reverts to that factory firmware the next time power is cycled off and on **unless** a firmware update is performed before the power cycle.

1. If necessary, turn off power to the switcher.
2. Press and **hold** the **Reset** button on the rear panel **while** you apply AC power either switcher power connector (see figure 27).

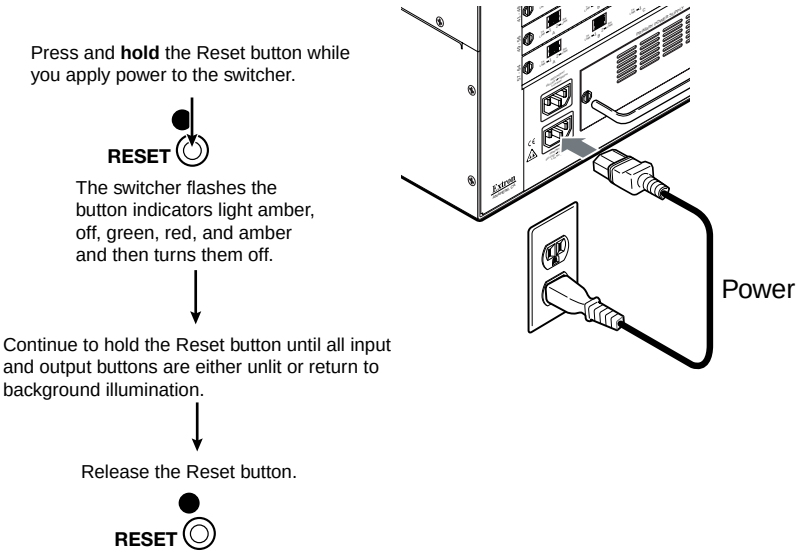

Press and **hold** the Reset button while you apply power to the switcher.
RESET
The switcher flashes the button indicators light amber, off, green, red, and amber and then turns them off.
Continue to hold the Reset button until all input and output buttons are either unlit or return to background illumination.
Release the Reset button.
RESET
Power

Figure 27. Hard Reset

Troubleshooting

This section recommends what to do if you have problems operating the switcher.

1. Ensure that all devices are plugged in and powered on.
2. Check to see if one or more outputs are muted.
3. Ensure an active input is selected for output on the switcher.
4. Ensure that the proper signal format is supplied.
5. Check the cabling and make corrections as necessary.
6. Call the Extron S3 Sales and Technical Support Hotline if necessary. See the **end** of this guide for the phone number in your region of the world.

Configuration Worksheets

Rather than trying to remember the configuration for each preset, use worksheets to record this information. Make copies of the blank worksheet on **page 50** or **page 51** and use one for each preset configuration. Cross out all unused or inactive inputs and outputs.

NOTE: All of the equipment in the following examples is connected through the appropriate fiber optic transmitter or receiver.

Worksheet Example 1: System equipment

Figure 28 shows a worksheet for a switcher configured as a 24-input by 24-output matrix in a fictional organization with the system hardware annotated. Inputs 10 and 11 have no connections in this organization, so they have been crossed out on the worksheet. Inputs 25 through 32 do not exist on this model, so they are crossed out. Similarly, outputs 7, 14, 15, 16, and 25 through 32 are crossed out on the worksheet.

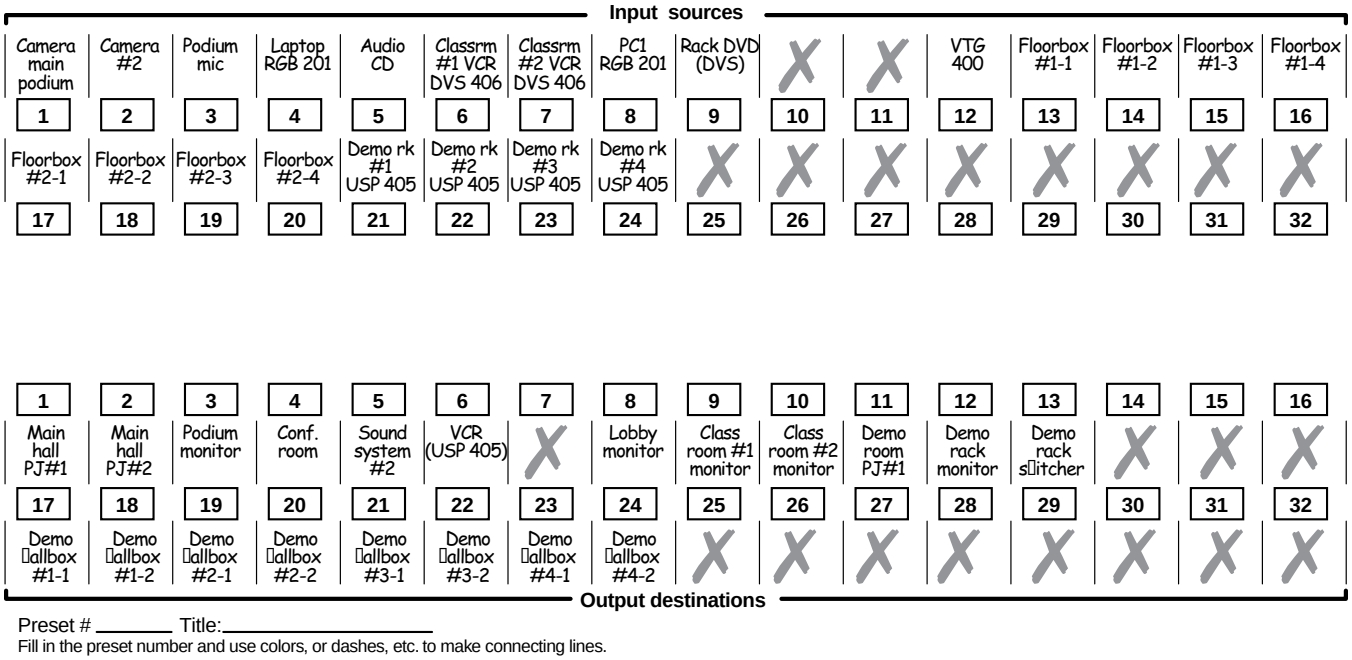


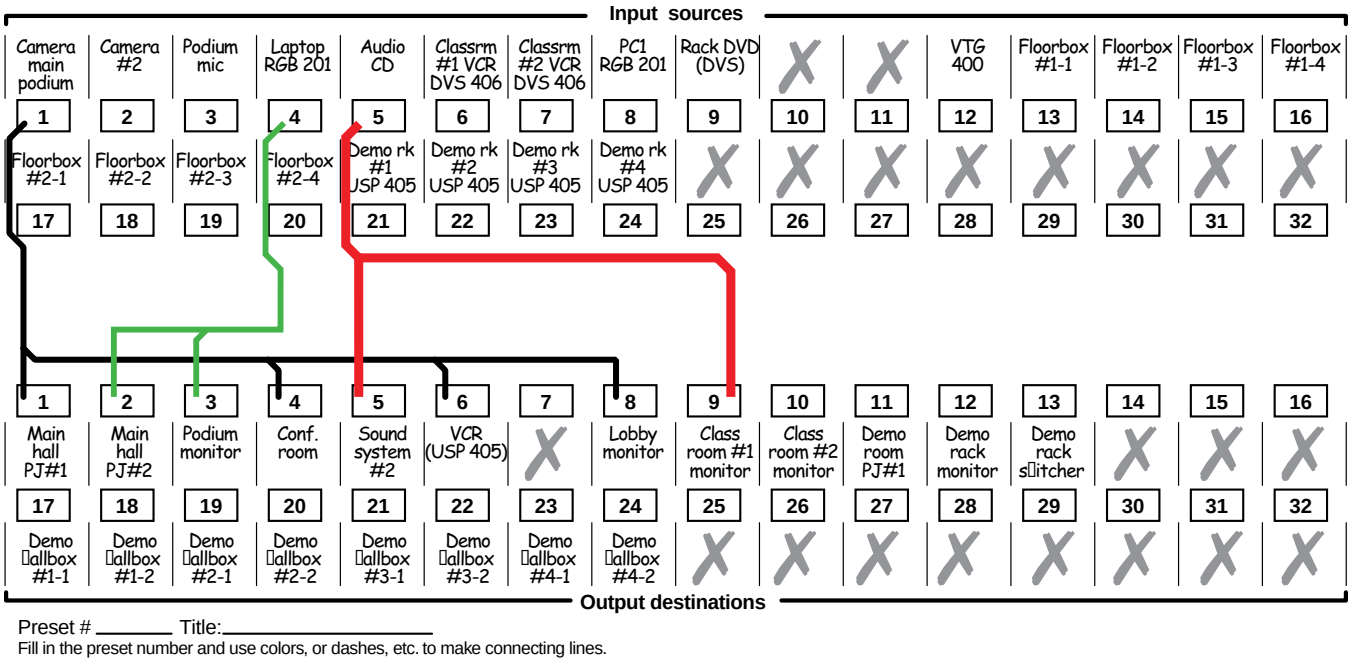
Figure 28. Worksheet Example 1: System Equipment

Inputs include PCs, an audio CD player, cameras, and an Extron VTG 400D. Output devices include monitors, front and rear projectors, a stereo, and a VCR for recording presentations.

The VTG 400D video test generator connected to input 12 enables a video test pattern to be sent to one, several, or all output devices for problem isolation or adjustment purposes. An audio test tape or CD could be used in a similar manner to check the audio components.

Worksheet Example 2: Daily Configuration

Figure 29 continues from worksheet example 1 by showing the ties that make up the configuration of preset 1. Black lines shows one configuration, green lines a second configuration, and red lines a third configuration.



Preset # _____ Title:_____

Fill in the preset number and use colors, or dashes, etc. to make connecting lines.

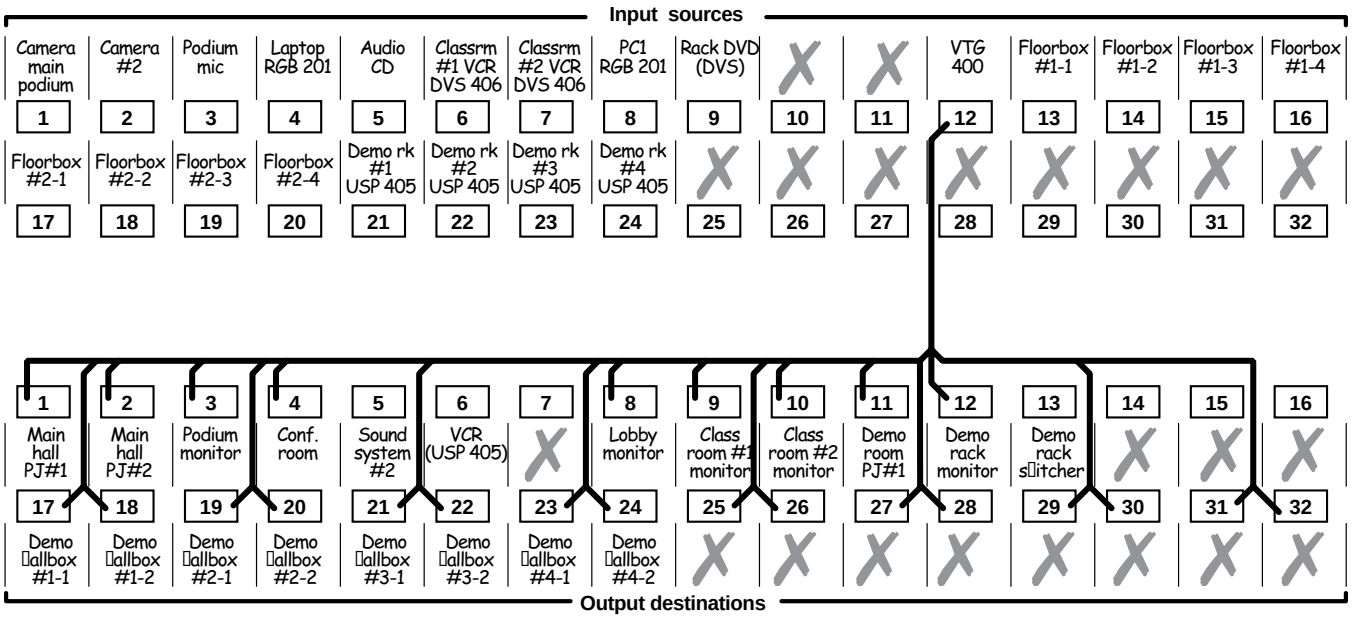
Figure 29. Worksheet Example 2: Daily Configuration

In this example:

- The image of the presenter, from the main podium camera (input 1), is:
  - Displayed in the main hall (output 1)
  - Displayed in the conference room (output 4) to the overflow crowd
  - Displayed in the lobby (output 8)
  - Tied to the VCR (output 6)
- The presenter has a presentation on her laptop computer (input 4) that is:
  - Displayed in the main hall (output 2)
  - Displayed locally on the podium (output 3)
- Music from the CD player (input 5) is:
  - Played in the background in the main hall on sound system #2 (output 5)
  - Played in Classroom 1 (output 9)

Worksheet Example 3: Test configuration

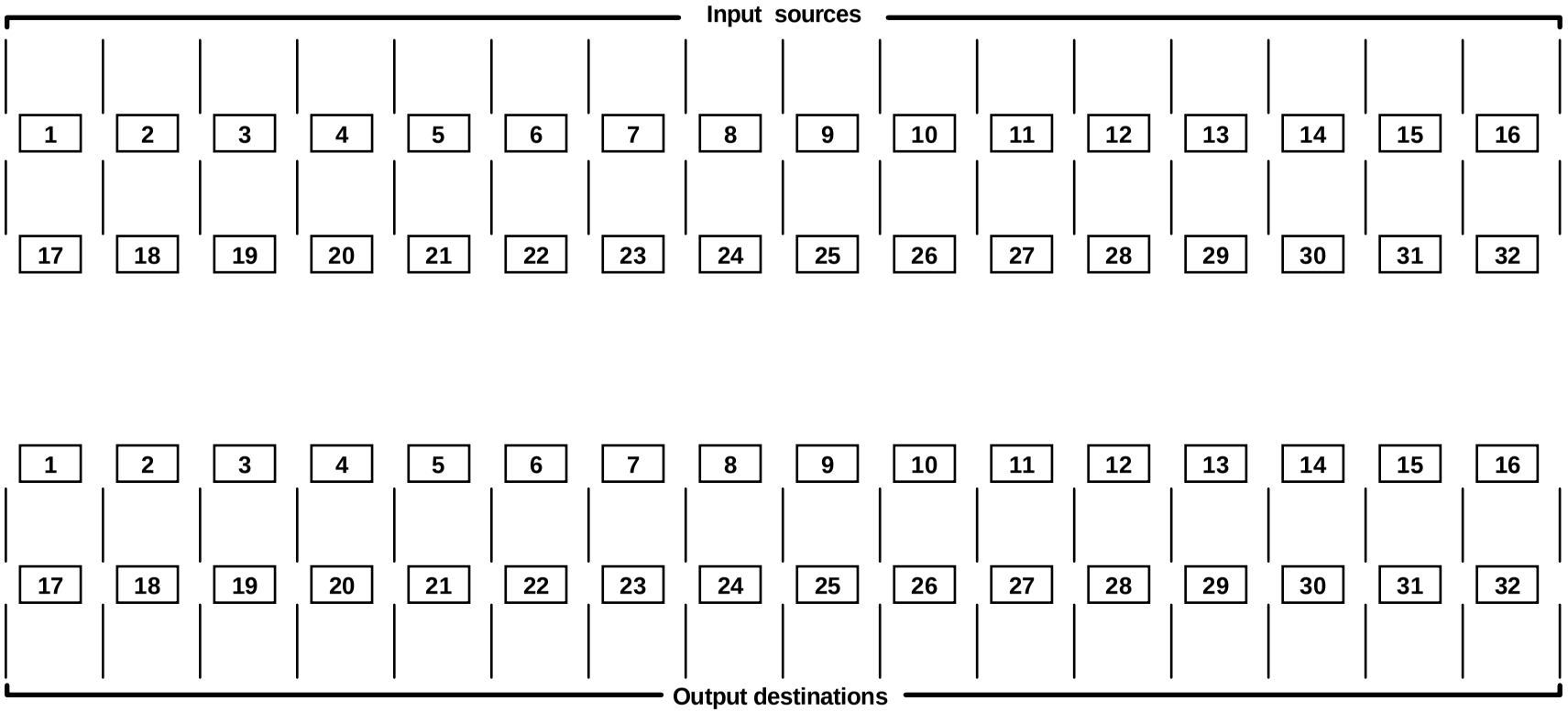
The AV system in our fictional organization needs to be fine tuned on a regular basis. Figure 30 shows a typical test configuration, with an Extron video test generator (input 12) generating a test pattern to all monitors (outputs 1, 2, 3, 4, 8, 9, 10, 11, and 12) and to the various wall boxes.


Input sources
Camera main podium
Camera #2
Podium mic
Laptop RGB 201
Audio CD
Classrm #1 VCR DVS 406
Classrm #2 VCR DVS 406
PC1 RGB 201
Rack DVD (DVS)
VTG 400
Floorbox #1-1
Floorbox #1-2
Floorbox #1-3
Floorbox #1-4
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Floorbox #2-1
Floorbox #2-2
Floorbox #2-3
Floorbox #2-4
Demo rk #1 USP 405
Demo rk #2 USP 405
Demo rk #3 USP 405
Demo rk #4 USP 405
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
Main hall PJ#1
Main hall PJ#2
Podium monitor
Conf. room
Sound system #2
VCR (USP 405)
Lobby monitor
Class room #1 monitor
Class room #2 monitor
Demo room PJ#1
Demo rack monitor
Demo rack switcher
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
Demo allbox #1-1
Demo allbox #1-2
Demo allbox #2-1
Demo allbox #2-2
Demo allbox #3-1
Demo allbox #3-2
Demo allbox #4-1
Demo allbox #4-2
Output destinations

Preset # _____ Title:_____

Fill in the preset number and use colors, or dashes, etc. to make connecting lines.

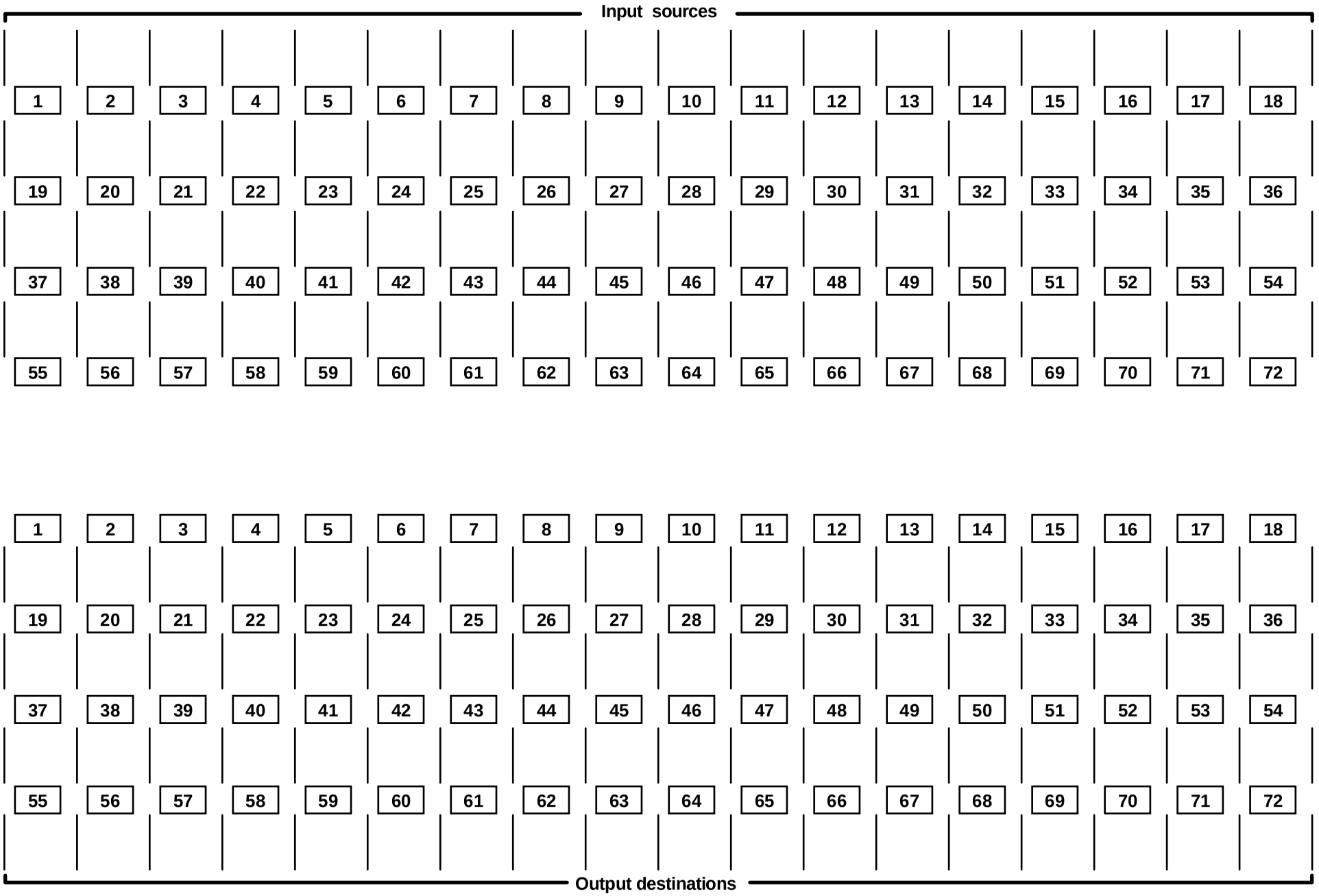
Figure 30. Worksheet Example 3: Test Configuration



Preset #

Fill in the preset number and use colors, or dashes, etc. to make connecting lines.

Blank Configuration worksheet, FOX Matrix 3200



Preset #

Fill in the preset number and use colors, or dashes, etc. to make connecting lines.

Blank Configuration Worksheet, FOX Matrix 7200

Programming Guide

This section describes the operation of the FOX matrix switchers via SIS commands, including:

- **Serial Ports**
- **Ethernet (LAN) Port**
- **Host-to-Switcher Instructions**
- **Switcher-Initiated Messages**
- **Switcher Error Responses**
- **Using the Command and Response Tables**
- **Command and Response Table for SIS Commands**
- **Command Response Table for IP- and SNMP-Specific SIS Commands**
- **Special Characters**

Serial Ports

The FOX matrix switcher has two serial ports that can be connected to a host device such as a computer running the HyperTerminal or DataViewer utility, or a control system. These ports make serial control of the switcher possible. The serial ports are:

- **Rear panel Remote port** — A 9-pin D connector for serial RS-232 or RS-422 control (see **Remote port** on page 13).
- **Front panel Configuration port** — A 2.5 mm mini stereo jack for serial RS-232 control (see **Front Panel Configuration Port** on page 17).

NOTES:

- The serial ports, the Remote port and the Configuration port, are independent of one another. A front panel Configuration port connection and a rear panel Remote port connection can be active at the same time. Commands are processed in the order received.
- The default serial port protocol of both ports is as follows:
  - 9600 baud
  - No parity
  - 8-bit
  - No flow control
  - 1 stop bit
- The rear panel Remote port can be configured from the front panel (see **Selecting the Rear Panel Remote Port Protocol and Baud Rate**, on page 42).
- The front panel Configuration port protocol can be changed via an SIS command only. See the **Set serial port parameters** SIS Command, on page 69, to configure both ports using an SIS command.
- The serial ports can be configured to operate at the 9600, 19200, 38400, or 115200 baud rate, but Extron recommends leaving these ports at 9600 baud only

Ethernet (LAN) Port

The rear panel Ethernet connector on the switcher can be connected to an Ethernet LAN or WAN. Communications between the switcher and the controlling device is via Telnet (a TCP socket using port 23). The SIS commands and the actions of the switcher are identical to the commands and actions the switcher has when communicating with it via RS-232.

The Ethernet cable can be terminated as a straight-through cable or a crossover cable and must be properly terminated for your application (see **Ethernet Connection** on page 13).

Default IP addresses

To access the FOX matrix switcher via the LAN port, you need the IP address for the unit, and may need the subnet mask and the gateway address. If the IP address has been changed to an address comprised of words and characters, you can determine the actual numeric IP address using the ping (ICMP) utility (see **Ethernet Link** on page 117 for more details). If the addresses have not been changed, the factory-specified defaults are:

- **IP address** 192.168.254.254
- **Gateway address** 0.0.0.0
- **Subnet mask** 255.255.0.0

Establishing a Connection

Establish a network connection to a FOX matrix switcher as follows:

1. Open a TCP socket to port 23 using the IP address of the switcher.

   NOTE: If the local system administrators have not changed the value, the factory-specified default, 192.168.254.254, is the value for this field.

   The switcher responds with a copyright message including the copyright year, the name of the product, firmware version, part number, and the current date and time.

   NOTES:
   - On password-protected connections, there are two levels of protection: administrator and user. Administrators have full access to all switching capabilities and editing functions. Users can create ties, create and recall presets, set mutes, and view all settings with the exception of passwords.
   - If the switcher is **not** password-protected, the device is ready to accept SIS commands immediately after it sends the copyright message.
   - If the switcher **is** password-protected, a `password` prompt appears below the copyright message.

2. If the switcher is password protected, enter the appropriate administrator or user password.

   If the password is accepted, the switcher responds with `Login User` or `Login Administrator`.

   If the password is not accepted, the `Password` prompt reappears.

Connection Timeouts

The Ethernet link times out after a designated period of time of no communications. By default, this timeout value is set to five minutes but the value can be changed. See the **Configure port timeout** SIS commands on page 69.

NOTE: Extron recommends leaving the default timeout at 5 minutes and periodically issuing the SIS **Q** command (see **Query firmware version** SIS command on page 65) to keep the connection active. If there are long idle periods, Extron recommends disconnecting the socket and reopening the connection when another command must be sent.

Number of Connections

A FOX matrix switcher can have up to 200 simultaneous TCP connections, including all http sockets and telnet connections. When the connection limit is reached, the switcher accepts no new connections until some have been closed. No error message or indication is given that the connection limit has been reached. To maximize performance of an IP Link device, keep the number of connections low and close unnecessary open sockets.

Using Verbose Mode

Telnet connections to a FOX matrix switcher can be used to monitor for changes that occur on the switcher, such as front panel operations and SIS commands from other telnet sockets or a serial port. For a telnet session to receive change notices from the switcher, the telnet session must be in verbose mode 1 or 3. See the **Verbose Mode** SIS command on page 69. In verbose mode 3, the telnet socket reports changes in messages that resemble SIS command responses.

Host-to-Switcher Instructions

The switcher accepts SIS commands through either serial port and the LAN port. SIS commands consist of one or more characters per command field. They do not require any special characters to begin or end the command character sequence. When a command is valid, the unit executes it and sends a response to the host device. Each switcher response to an SIS command ends with a carriage return and a line feed (CR/LF = ↵), which signals the end of the response character string. A string is one or more characters.

Switcher-initiated Messages

When a local event such as a front panel operation or an IR 501 command string occurs, the switcher responds by sending a message to the host. The switcher-initiated messages are listed below (underlined).

The switcher does not expect a response from the host, but, for example, the host program might request a new status.

(C) COPYRIGHT 20*yy*, Extron Electronics, FOX Matrix 3200, V*x.xx*, 60-*nnnn*-01↵
{day,date, time}↵

— or —

(C) COPYRIGHT 20*yy*, Extron Electronics, FOX Matrix 7200, V*x.xx*,60-*nnnn*-01↵
{day,date, time}↵

The switcher initiates the copyright message when it is first powered on or when a connection via Internet protocol (IP) is established. V*x.xx* is the firmware version number and 60-*nnnn*-01 is the switcher part number.

NOTE: {Day, date, time} are only reported if the connection is via the LAN port.

Password:↵

The switcher initiates the password message immediately after the copyright message when the controlling system is connected using TCP/IP or Telnet and the switcher is password protected. This message means that the switcher requires an administrator or user level password before it will perform the commands entered via this link. The switcher repeats the password message response for every entry other than a valid password until a valid password is entered.

↵Login Administrator↵

↵Login User↵

The switcher initiates the login message when a correct administrator or user password has been entered. If the user and administrator passwords are the same, the switcher defaults to administrator privileges.

Qik↵

The switcher initiates the **Qik** message when a front panel tie operation has occurred.

Spr*nn*↵

The switcher initiates the **Spr** message when a memory preset has been saved from the front panel. "*nn*" is the preset number.

Rpr*nn*↵

The switcher initiates the **Rpr** message when a memory preset has been recalled from the front panel. "*nn*" is the preset number.

Vmt*nn***x*↵

The switcher initiates the **Vmt** message when a channel output mute is toggled on or off from the front panel. *nn* is the output number and *x* is the mute status: **1** = on, **Ø** = off.

Exe*n*↵

The switcher initiates the **Exe** message when the front panel security lockout (executive mode) is toggled on or off from the front panel. "*n*" is the lock mode: **Ø** = unlocked, **1** = locked.

Switcher Error Responses

When the switcher receives an SIS command and determines that it is valid, it performs the command and sends a response to the host device. If the switcher is unable to perform the command because the command is invalid or contains invalid parameters, the switcher returns an error response to the host. The error response codes are:

E01 — Invalid input channel number (out of range)
E10 — Invalid command
E11 — Invalid preset number (out of range)
E12 — Invalid output number (out of range)
E13 — Invalid value (out of range)
E14 — Invalid command for this configuration
E17 — Timeout (caused only by direct write of global presets)
E21 — Invalid room number
E24 — Privileges violation (Ethernet only. Personnel logged in as users attempting operations requiring administrator privileges. Users have access to all view and read commands [other than the administrator password], and can create ties and presets, and mute and unmute the output.)

Using the Command and Response Tables

The command and response table begins on **page 59**. Symbols, defined on the **next page** and used throughout the table, represent variables in the command and response fields. Command and response examples are shown throughout the table. The SIS commands are **not** case sensitive unless specifically noted. The ASCII to Hex conversion table below is for use with the command and response table.

Space →

ASCII to Hex Conversion Table										Esc	1B	CR	0D	LF	0A
	20	!	21	"	22	#	23	$	24	%	25	&	26	'	27
(	28	)	29	*	2A	+	2B	,	2C	-	2D	.	2E	/	2F
0	30	1	31	2	32	3	33	4	34	5	35	6	36	7	37
8	38	9	39	:	3A	;	3B	<	3C	=	3D	>	3E	?	3F
@	40	A	41	B	42	C	43	D	44	E	45	F	46	G	47
H	48	I	49	J	4A	K	4B	L	4C	M	4D	N	4E	O	4F
P	50	Q	51	R	52	S	53	T	54	U	55	V	56	W	57
X	58	Y	59	Z	5A	[	5B	\	5C	]	5D	^	5E	_	5F
`	60	a	61	b	62	c	63	d	64	e	65	f	66	g	67
h	68	i	69	j	6A	k	6B	l	6C	m	6D	n	6E	o	6F
p	70	q	71	r	72	s	73	t	74	u	75	v	76	w	77
x	78	y	79	z	7A	{	7B	|	7C	}	7D	~	7E	DEL	7F

Command and Response Table for SIS Commands

Symbol Definitions

↵ = CR/LF (carriage return with line feed) (hex ØD ØA)

← = Carriage return (no line feed, hex ØD) (| [Pipe] can be used interchangeably with the ← character)

• = Space character (W can be used interchangeably with the Esc character)

X1 = Input number (for tie) ØØ – 32 (FOX Matrix 3200) or 72 (FOX Matrix 7200) (ØØ = untied)

X2 = Output number ØØ – 32 (FOX Matrix 3200) or 72 (FOX Matrix 7200) (ØØ = untied)

X3 = Mute Ø = not muted 1 = muted

X4 = SFP or reclockable output number ØØ – 32 or 72 (ØØ = global [SFP only])

X5 = Output reclocking rate
ØØ = Bypass mode
Ø1* = Auto (HDSDI boards) or N/A (laser boards) Ø3 = 2.125 Gbps (laser boards only)
Ø2 = 1.250 Gbps (laser boards only) Ø4* = 4.250 Gbps (laser boards only)

X6 = Laser control Ø = disable 1 = enable (**default**) 2 = automatic

X7 = Global preset # ØØ – 32 (3200) or 72 (7200) (ØØ = current configuration for view only)

X8 = Room number (for room presets) Ø1 – 1Ø maximum (each can have up to 10 presets (X10) assigned)

NOTE: A Room is a subset of operator-selected outputs that relate to each other. The FOX matrix switcher supports up to 10 rooms, each of which can consist of 1 to 16 outputs.

X9 = Name Up to 12 characters for input and output names and global and room preset names
Upper- and lower-case alphanumeric characters and _ / and spaces are valid.

NOTE: The following characters are invalid or not recommended in the name: ~ , @ = ‘ [ ] { } < > ’ “ ; : | \ and ?.

X10 = Room preset number Ø1 – 1Ø maximum

NOTE: A Room preset is a stored configuration with all outputs in a single room. A retrieved room preset becomes the current configuration.

X11 = Connection status Ø = no input connected 1 = input connected

X12 = Group number (for I/O grouping) 1 (group 1) through 4 (group 4) (or Ø = no group)

X13 = Input number (for other than tie) Ø1 – 32 (FOX Matrix 3200) or 72 (FOX Matrix 7200)

X14 = Lock mode status Ø = unlocked 1 = locked

X15 = Number (quantity) of inputs 8, 16, 24, 32, 4Ø, 48, 56, 64, or 72

X16 = Number (quantity) of outputs 8, 16, 24, 32, 4Ø, 48, 56, 64, or 72

X17 = Board installed
Ø = No board installed
1 = Non-reclocking multimode board†
2 = Non-reclocking singlemode board†
3 = 3G, SDI, HD-SDI board
4 = Non-pathological multimode board
5 = Non-pathological singlemode board
6 = Pathological singlemode board
x = Unknown board or mix of transceivers

X18 = I/O board slot number 1 – 9 (FOX Matrix 7200) or 1 – 4 (FOX Matrix 3200)

X19 = Transceiver module installed
Ø = No module installed
1 = Non-pathological multimode module
2 = Non-pathological singlemode module
3 = 3G-SDI, HD-SDI, SD-SDI module
4 = Pathological singlemode module

X20 = Transceiver module number Ø1 – 72 (or maximum number of transceiver modules for your configuration)

X21 = Vendor or manufacturer name

X22 = Transmit output power in milliwatts

X23 = Receive optical power in milliwatts

X24 = SFP temperature Degrees Celsius

X25 = Firmware version number to second decimal place (x.xx)

X26 = Verbose firmware version-description-upload dateandtime. See the Query controller firmware version (verbose) command on **page 65**.

X27 = Voltage Positive or negative voltage and magnitude

X28 = Switcher temperature Degrees Fahrenheit

X29 = Fan speed In revolutions per minute (RPM)

* Ø1 is default for HDSDI boards, Ø4 is default for laser boards.

† Legacy board, no longer manufactured, identified for completeness only.

Command and Response Table for SIS Commands

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
NOTES: • The matrix switchers support 1- and 2-digit numeric entries (1*1 or Ø2*Ø2). • Commands can be entered back-to-back in a string, with no spaces. For example: 1*1!Ø2*Ø2&Ø3*Ø3%4*8!.			
Create ties			
NOTES: • The quick multiple tie and tie input to all output commands activate all I/O switches simultaneously. • The ! **tie** command, & **tie** command, and % **tie** command can be used interchangeably. • The ! **tie all** command, & **tie all** command, and % **tie all** command can be used interchangeably. • When you create a tie where X1 = ØØ, you tie no input to the specified output (X2) (untie X2). When you create a tie where X2 = ØØ, you untie all outputs from input X1.			
Tie input X1 to output X2,	X1*X2!	Out X2 • In X1 • All ↵	Tie input X1 to output X2.
Example:	1*3!	OutØ3•InØ1•All↵	Tie input 1 to output 3.
Tie input X1 to output X2,	X1*X2&	Out X2 • In X1 • RGB ↵	Tie input X1 to output X2.
Example (see 2nd Note bullet, above):	1Ø*4&	OutØ4•In1Ø•RGB↵	Tie input 10 RGB to output 4.
Tie input X1 to output X2	X1*X2%	Out X2 • In X1 • Vid ↵	Tie input X1 to output X2.
Example (see 2nd Note bullet, above):	7*5%	OutØ5•InØ7•Vid↵	Tie input 7 video to output 5.
Quick multiple tie	Esc+Q X1*X2!...X1*X2&←	Qik↵	
Example:	Esc+Q3*4!3*5%3*6&←	Qik↵	Tie input 3 to output 4, tie input 3 to output 5, and tie input 3 to output 6.
Tie input to all outputs	X1*!	In X1 • All ↵	
Example (see last Note bullet, above):	5*!	InØ5•All↵	Tie input 5 to all outputs.
TIP: Ø*! clears all ties.			
Tie input to all outputs	X1*&	In X1 • RGB ↵	
Example (see last Note bullet, above):	8*&	InØ8•RGB↵	Tie input 8 to all outputs.
Tie input to all outputs	X1*%	In X1 • Vid ↵	
Example (see last Note bullet, above):	1Ø*%	In1Ø•Vid↵	Tie input 10 to all outputs.
Read ties			
NOTES: • The ! **read tie** command, & **read tie** command, and % **read tie** command can be used interchangeably. • When the switcher is in verbose mode, the response is Out X2 • In X1 •(All)(RGB) or (Vid)↵.			
Read tied input	X2!	X1↵	Input X1 is tied to output X2.
Read tied input, RGB output	X2&	X1↵	Input X1 is tied to output X2.
Read tied input, Vid output	X2%	X1↵	Input X1 is tied to output X2.
Channel mute commands			
Channel mute	X2*1B	Vmt X2 *1↵	Mute output X2 channel (no signal is output, but the light output remains active).
Channel unmute	X2*ØB	Vmt X2 *Ø↵	Unmute output X2 channel (signal is output).
Read channel mute	X2B	X3↵	1 = mute on, Ø = mute off.
Global channel mute	1*B	Vmt1↵	Mute all output channels.
Global channel unmute	Ø*B	VmtØ↵	Unmute all output channels.

NOTE: X1 = Input number (for tie) — ØØ – (maximum number of inputs for your configuration) (ØØ = untied)
X2 = Output number — ØØ – (maximum number of outputs for your configuration) (ØØ = untied)
X3 = Mute — Ø = not muted, 1 = muted

Command and Response Table for SIS Commands (continued)

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
Reclocking			
NOTES: • Laser board reclockers are set on a per SFP basis. If an SFP is reclocked, the corresponding input and output reclockers reclock at the same rate. • HD-SDI reclockers are set on a per output basis only. • If the connected input or output device is a FOX USB Extender unit, ensure that the re-clockers are set to bypass mode.			
Set output reclocker	X4*X5=	RteX4*X5↵	Set the rate for reclocker X4 to X5.
Example:	8*ØØ=	RteØ8*ØØ↵	Set the rate for reclocker 8 to auto.
Read reclocker status	X4=	X5↵	Show current rate status for reclocker X4.
Laser controls			
Enable individual laser driver	Esc X2 *1FIBR←	FibrX2*1↵	Enable the laser for output X2. The laser lights so long as power is applied.
Disable individual laser driver	Esc X2 *ØFIBR←	FibrX2*Ø↵	Disable the laser for output X2. The laser is off.
Set individual output laser driver to automatic	Esc X2 *2FIBR←	FibrX2*2↵	Set the laser driver for output X2 to automatic. The laser lights when a tie is made to output X2, but is off when no tie is made to output X2 or the output is muted.
Read status of all laser drivers	EscFIBR←	$X6^{1}$ $X6^{2}$ $X6^{3}$ $X6^{4}$ ... $X6^{n}$↵	List the laser driver status of all installed outputs. *n* is the highest numbered output for your switcher.
Global laser enable	Esc 1*FIBR←	Fibr1↵	Enable all output laser drivers.
NOTE: If your switcher has **any** BNC 3G/HD/SD-SDI boards installed, the global commands are not available. The switcher returns E14.			
Global laser disable	EscØ*FIBR←	FibrØ↵	Disable all output laser drivers.
Global laser automatic	Esc 2*FIBR←	Fibr2↵	Set all output laser drivers to automatic.
Save, recall, and directly write global presets			
NOTES: • If you try to recall a preset that is not saved, the matrix switcher responds with the error code E11. • The following characters are invalid or not recommended in preset names: + - , ` @ = [ ] { } ‘ “ ; : | \ and ?.			
Save current configuration as a global preset	X7,	SprX7↵	Command character is a comma.
Example:	8,	SprØ8↵	Save current ties as preset 8.
Recall a global preset	X7.	RprX7↵	Command character is a period.
Example:	5.	RprØ5↵	Recall preset 5 (becomes the current configuration).

NOTE:
X1 = Input number (for tie) — ØØ – (maximum number of inputs for your configuration) (ØØ = untied)
X2 = Output number — Ø1 – (maximum number of outputs for your configuration)
X4 = SFP or reclockable output — ØØ – 32 or 72 (ØØ = global [SFP only])
X5 = Output reclocking rate — ØØ = Bypass mode; Ø1 = Automatic mode (HDSDI [**default**] only) or N/A (laser); Ø2 = 1.250 Gbps (laser boards only); Ø3 = 2.125 Gbps (laser only); Ø4 = 4.250 Gbps (laser only [**default**])
X6 = Laser control — Ø = disable; 1 = enable **(default)**; 2 = automatic
X7 = Global preset number — ØØ – 32 (FOX Matrix 3200) or 64 (FOX Matrix 7200) (ØØ = current configuration)

Command and Response Table for SIS Commands (continued)

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
Save, recall, and directly write global presets (continued)			
Direct write process —			
NOTE: The direct write of a global preset should always be preceded by a clear global preset ties command of that same preset number. In a directly-written preset, the tied input of each output position (or no tied input) remains unchanged unless overwritten or cleared. If you do not clear the ties in a global preset number before you directly write a global preset to that number, ties that are part of the previous version of the specified preset with the same number can unexpectedly become part of the newly-created preset.			
Clear global preset ties	Esc+X7PØ*!←	Spr X7↵	Clear all ties in preset X7.
Directly write a global preset	Esc+X7PX1*X2!X1*X2%X1*X2! ... X1*X2&← Spr X7↵		Enter as many ties as are valid for this configuration. The **! tie**, **& tie**, and **% tie** commands are all valid.
Example:	Esc+27PØ*!← Esc+27P12*5!10*Ø9%3*2!3*8&← Spr27↵	Spr27↵	Clear all ties in preset 27. Brackets are shown to separate ties for clarity only. Create global preset 27, which ties input 12 to output 5, input 10 to output 9, input 3 to output 2, and input 3 to output 8.
NOTES: • If a room is not defined (does not exist in the switcher), the matrix switcher responds with the error code E11. • A room can contain a maximum of 16 outputs (X2s). • An output can belong to only one room. • The maximum number of rooms (X8s) is 10. • The default name (X9) is the room number with four trailing spaces: "Room•#X8••••"			
Write room outputs	Esc X8,X2¹,X2², ... X2ⁿMR←	Mpr X8,X2¹,X2², ... X2ⁿ↵	See the notes above.
Example:	Esc8,3,Ø4,5,6MR←	Mpr8,Ø3,Ø4,Ø5,Ø6↵	Outputs 3, 4, 5, and 6 are assigned to room 8.
Read room outputs	Esc X8MR←	X9,X2¹,X2², ... X2ⁿ↵	
Example:	Esc3MR←	Class1,Ø1,Ø2,Ø8,Ø9↵	Outputs 1, 2, 8, and 9 are assigned to room 3, which is named "Class1".
Save current ties as a room preset	X8*X10,	Rmm X8•Spr X10↵	Command character is a comma.
Example:	3*9,	RmmØ3•SprØ9↵	Save current ties as preset 9 for room 3.
Recall room preset	X8*X10.	Rmm X8•Rpr X10↵	Command character is a period.
Clear room preset ties	Esc+X8*X10PØ*!←	Rmm X8•Spr X10↵	Clear all ties in room X8 preset X10.
Directly write a room preset	Esc+X8*X10PX1*X2!X1*X2%X1*X2! ... X1*X2&← Rmm X8•Spr X10↵		Enter as many ties as are valid for this configuration. The **! tie** command, **& tie**, and **% tie** commands are all valid and equivalent.
Example:	Esc+7*3P12*7&11*5!4*5%6*6!← RmmØ7•SprØ3↵		Brackets are shown to separate ties for clarity only. Create preset 3 for room 7, which ties input 12 to output 7, input 11 to output 5, input 4 to output 5, and input 6 to output 6.
View ties, mutes, and presets			
NOTE: The **& read tie** command and **% read tie** command can be used interchangeably.			
View output tie	X2!	X1↵	Input X1 is tied to output X2.
Example:	1!	Ø5↵	Input 1 is tied to output 5.
View output tie	X2&	X1↵	
Example:	15&	27↵	Input 27 is tied to output 15.
View output tie	X2%	X1↵	
Example:	7%	Ø2↵	Input 2 is tied to output 7.

NOTE:	X1 = Input number (for tie)	ØØ – (maximum number of inputs for your configuration) (ØØ = untied)
	X2 = Output number	Ø1 – (maximum number of outputs for your configuration)
	X7 = Global preset number	ØØ – 32 (FOX Matrix 3200) or 64 (FOX Matrix 7200) (ØØ = current configuration)
	X8 = Room number (for room presets)	Ø1 – 1Ø maximum (each can have up to 10 presets (X10) assigned)
	X9 = Room name	12 characters maximum
	X10 = Room preset number	Ø1 – 1Ø maximum

Command and Response Table for SIS Commands (continued)

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
View ties, mutes, and presets (continued)			
View all output mute status	Esc VM ←	X3[1] X3[2] X3[3] ... X3[n]	Each X3 response is the mute status of an output, starting from output 1. *n* is the highest-numbered output.

NOTES:

- The switcher reports the mute status for all outputs, up to the highest numbered output on the highest numbered slot with an I/O board installed. The switcher does not recognize gaps in the board installation. For example, if boards are installed in only slots 1 and 3, leaving slot 2 empty, the switcher returns mute status for 24 sequential outputs. The mute status for the outputs in slot 2, inputs 9 through 16, can be ones or zeroes (the switcher allows you to mute an output that is not installed, so long as it is numbered lower than the highest numbered output installed).
- When the switcher is in Verbose mode 1 or 3 (see the **Set verbose mode** SIS command on page 69), the response includes "Mut" before the X3s.

View global preset configuration	Esc X7 * X2 * 1VC ←	X1[n] • X1[n+1] • ... • X1[n+15] • Vid ↵	Show the configuration of preset X7. Show the input tied to 16 sequential outputs, starting from output X2.
Command description:	preset # (X7)*starting output # (X2)*1VC ←		
Response description:	input # (X1) tied to X2[n] • X1 tied to X2[n+1] • X1 tied to X2[n+2] • ... • X1 tied to X2[n+15] • Vid ↵		
*Example (**8 x 8 matrix**):*	Esc 23*1*1VC ←		

input 8 tied to output 4; input 2 tied to output 3; no tied input; outputs do not exist

Response = tied input: Ø8 • Ø8 • Ø2 • Ø8 • Ø8 • Ø1 • ØØ • ØØ • _ • _ • _ • _ • _ • _ • _ • _ • Vid ↵

Output: 1 2 3 4 5 6 7 8 09 10 11 12 13 14 15 16

Each position shown in the response is an output: left = starting output number (1 in this example), right = starting output number + 15 (16 in this example). (Outputs 9 through 16 are not present on this matrix switcher.) The number in each position is the input tied to that output.

In this example, for preset 23, video input 8 is tied to outputs 1, 2, 4, and 5; input 2 is tied to output 3; and input 1 is tied to output 6. No inputs are tied to outputs 7 and 8.

NOTE: Esc X7 *1*X2VC ← where X7 = Ø returns 16 ties in the current video configuration of the switcher, starting from output X2.

View room preset configuration	Esc X8 * X10 * X2 * 1VC ←	X1[n] • X1[n+1] • ... • X1[n+15] • Vid ↵	Show configuration of room X8, preset X10. Show the input tied to up to 16 outputs assigned to room X8.
Command description:	room # (X8)*room preset # (X10)*starting output # (X2)*1VC		
Response description:	input # (X1) tied to X2 • X1 tied to X2[+1] • X1 tied to X2[+2] • ... • X1 tied to X2[+15] • Vid ↵		

List input link detection

NOTE: The switcher reports the link status for all outputs, up to the highest numbered output on the highest numbered slot with an I/O board installed. The switcher does not recognize gaps in the board installation. For example, if only two boards are installed, in slots 1 and 3, leaving slot 2 empty, the switcher returns link status for 24 sequential inputs. The input link response for the inputs supported by the board in slot 2, inputs 9 through 16, are all zeroes.

View all input connections	ØLS	X11[1] X11[2] X11[3] X11[4] ... X11[n] ↵	Each X11 response is the connection status of an input, starting from input 1. *n* is the highest-numbered input.
*Example (**32 x 32 matrix**):*	LS		

no input detected; input detected

Response Status: Ø Ø Ø 1 1 1 Ø . . . Ø ↵

Input: 1 2 3 4 5 6 7 32

NOTE: X1 = Input number (for tie)	ØØ – (maximum number of inputs for your configuration) (ØØ = untied)	
X2 = Output number	Ø1 – (maximum number of outputs for your configuration)	
X3 = Mute	Ø = not muted, 1 = muted	
X7 = Global preset number	ØØ – 32 (FOX Matrix 3200) or 64 (FOX Matrix 7200) (ØØ = current configuration for view only)	
X8 = Room number (for room presets)	Ø1 – 1Ø maximum (each can have up to 10 presets (X10) assigned)	
X10 = Room preset number	Ø1 – 1Ø maximum	
X11 = Connection status	Ø = no input connected	1 = input connected

Command and Response Table for SIS Commands (continued)

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
I/O grouping			
NOTE: The group that is assigned in each of the following I/O grouping commands (X12) must be 1, 2, 3, 4, or Ø (not grouped).			
Write input grouping	Esc X12¹ X12²…X12ⁿ I ←	Gri X12¹ X12² X12³…X12ⁿ ↵	Each X12 entry is the group number assigned to an input, starting from input 1. *n* is the highest-numbered input.
*Example (**16 x 16 matrix**):*	Esc 4Ø133ØØØØ44...4I ←	See below.	Input 1 is in Group 4, Input 2 is in Group 0 (not grouped), ... Input 16 is in Group 4.
	Input 1 in group 4 Input 2 not grouped Input 16 in group 4 Response #s = group: Gri 4,Ø,1,3,3,Ø,Ø,Ø,Ø,4,Ø,Ø,Ø,4,4,4 ↵ Input: 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16		
Write output grouping	Esc X12¹ X12²…X12ⁿ O ←	Gro X12¹ X12² X12³…X12ⁿ ↵	Each X12 entry is the group number assigned to an output, starting from output 1. *n* is the highest-numbered output.
Read input grouping	Esc I ←	X12¹ X12² X12³…X12ⁿ ↵	Each X12 entry is the group number assigned to an input, starting from input 1. *n* is the highest-numbered input.
*Example (**8 x 8 matrix**):*	Esc I ←	Input 1 in group 1 Input 8 not grouped Response = group: 1,1,1,3,3,Ø,Ø,Ø ↵ Input: 01 02 03 04 05 06 07 08	
Read output grouping	Esc O ←	X12¹ X12² X12³…X12ⁿ ↵	Each X12 entry is the group number assigned to an output, starting from output 1. *n* is the highest-numbered output.
Names			
NOTES: • The HTML language reserves certain characters for specific functions (see **Special Characters** on page 70). • Do not use leading spaces in preset names. • If a preset is unassigned, the name (X9) displays [unassigned]. • If a global preset is saved, but not yet named, the default name is Preset•X7. • If a room preset is saved, but not yet named, the default name is RmX8•PrstX10.			
Write global preset name	Esc X7,X9NG ←	Nmg X7,X9 ↵	
Example:	Esc 1,Security 1NG ←	Nmg Ø1,Security 1 ↵	Name global preset 1 “Security 1”.
Read global preset name	Esc X7NG ←	X9 ↵	
Example:	Esc 2NG ←	Security 2 ↵	Global preset 2 is named “Security 2”.
Write room preset name	Esc X8*X10,X9NP ←	Nmp X8*X10,X9 ↵	
Example:	Esc 1*3,Podium_DVDNP ←	Nmp Ø1*3,Podium_DVD ↵	Name room 1, preset 3 “Podium_DVD”.
Read room preset name	Esc X8*X10NP ←	X9 ↵	
Write input name	Esc X13,X9NI ←	Nmi X13,X9 ↵	
Example:	Esc 1,Podium camNI ←	Nmi Ø1,Podium cam ↵	Name input 1 “Podium cam”.
Read input name	Esc X13NI ←	X9 ↵	
Write output name	Esc X2,X9NO ←	Nmo X2,X9 ↵	
Example:	Esc 1,Main PJ1NO ←	Nmo Ø1,Main PJ1 ↵	Name output 1 “Main PJ1”.
Read output name	Esc X2NO ←	X9 ↵	

NOTE:	X2 = Output number	Ø1 – (maximum number of outputs for your configuration)
	X7 = Global preset number	ØØ – 32 (FOX Matrix 3200) or 64 (FOX Matrix 7200) (ØØ = current configuration)
	X8 = Room # (for room presets)	Ø1 – 1Ø (each can have up to 10 presets (X9s) assigned)
	X9 = Room name	12 characters maximum
	X10 = Room preset number	ØØ – 1Ø maximum (0 = current configuration for room)
	X12 = Group number (for I/O grouping)	1 (group 1) through 4 (group 4) (or Ø = no group)
	X13 = Input number (for other than tie)	Ø1 – (maximum number of inputs for your configuration)

Command and Response Table for SIS Commands (continued)

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
Front panel lockout (*Executive* mode)			
Lock front panel	1X	Exe1↵	Enable executive mode.
Unlock front panel	ØX	ExeØ↵	Disable executive mode.
View lock status	X	X14↵	
Resets			
Reset global presets and names	Esc ZG←	Zpg↵	Clear all global presets and their names.
Reset **one** global preset	Esc X7 ZG←	Zpg X7↵	Clear global preset X7.
Reset all mutes	Esc ZZ←	Zpz↵	Unmute all outputs.
Reset room map	Esc ZR←	Zpr↵	Clear all room definitions.
Reset individual room	Esc X8 ZR←	Zpr X8↵	Delete room X8.
Reset all room presets	Esc ZP←	Zpp↵	Clear all room presets and names.
Reset individual room preset	Esc X8 * X10 ZP←	Zpp X8 * X10↵	Clear an individual room preset and name.
Reset whole switcher	Esc ZXXX←	Zpx↵	Clear all ties and presets, rooms, and I/O names.
Absolute reset	Esc ZQQQ←	Zpq↵	Similar to **Reset whole switcher**, above, plus clear the IP address to 192.168.254.254 and subnet mask to 255.255.000.000.
Reset all device settings	Esc ZY←	Zpy↵	Similar to absolute reset, **above**, but excludes the following IP settings: IP address, subnet mask, gateway address, unit name, DHCP setting, and port mapping (telnet, web, and direct address).
File management			
NOTE: The response to the View File Directory command differs, depending on whether the command is sent via an RS-232/RS-422 or Telnet connection or sent via a web browser connection.			
View file directory RS-232/RS-422 port and Telnet	Esc DF←	*filename*1,*date and time*,*length*↵ *filename*2,*date and time*,*length*↵ *filename*3,*date and time*,*length*↵ • • • • *filename*n,*date and time*,*length*↵ # *of* Bytes•Left↵↵ List user-supplied files.	
View file directory Web browser	Esc DF←	Var file = new array (); File [1] = '*filename*1,*date*1,*filesize*1'; File [2] = '*filename*2,*date*2,*filesize*2'; File [3] = '*filename*3,*date*3,*filesize*3'; • • • • File [*n*] = '*filename*n,*date*n,*filesize*n'; File [*n+1*] = # *of* Bytes•Left List user-supplied files.	
Erase user-supplied web pages or files	Esc<*filename*>EF←	Del<*filename*>↵	

NOTE: X7 = Global preset number — Ø1 – 32 (FOX Matrix 3200) or 64 (FOX Matrix 7200)
X8 = Room # (for room presets) — Ø1 – 1Ø (each can have up to 10 presets (X9s) assigned)
X10 = Room preset number — Ø1 – 1Ø maximum
X14 = Lock mode status — Ø = unlocked 1 = locked

Command and Response Table for SIS Commands (continued)

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
Information requests			
Information request	I	V[X15]X[X16]•A[X15]X[X16]•S[X17]^{1}[X17]^{2}...[X17]^{n}↵	V[X15]X[X16] shows the number of available inputs and outputs for this configuration. A[X15]X[X16] has no meaning for this product. S[X17]^{1}[X17]^{2}...[X17]^{n} shows the board type installed in each slot. *n* is either 4 or 9, depending on the model.
Slot, plane, and LC information	Ø*[X18]I	[X19]^{1}[X19]^{2}[X19]^{3}[X19]^{4}[X19]^{5}[X19]^{6}[X19]^{7}[X19]^{8}↵	
Request part number	N	6Ø-*nnnn*-*nn*↵	See **www.extron.com**, for part numbers.
Request part number and board configuration	*N	6Ø-*nnnn*-*nn*.[X17]^{1}[X17]^{2}[X17]^{3} ... [X17]^{n}↵	Part number (see below) plus I/O boards installed. *n* is either 4 or 9, depending on the model.
Read reclocker status	[X4]=	[X5]↵	Show current rate status for reclocker [X4].
NOTE: The switcher automatically detects and reclocks the signal if the rate is 4.25 Gbps only. Other rates are ignored.			
View SFP module status	4Ø*[X20]S	[X21]•[X22]•[X23]•[X24]↵	
NOTE: There are up to three separate sets of Extron firmware on which the switcher can report: the controller firmware, which is the overall control firmware; the Ethernet protocol firmware, which handles the Ethernet interface; and the latest optional Extron firmware update, which is available at **www.extron.com**.			
Query firmware version	Q	[X25]↵	
Example:	Q	1.23↵	The factory-installed controller firmware version is 1.23 (sample value only).
Query controller firmware version (verbose)	ØQ	[X25]-[X26]-[X26]↵	Provide a detailed status of the Ethernet protocol firmware, the controller firmware, and any firmware upgrade. The firmware that is running is marked by an asterisk (*). A caret (^) indicates that the firmware has a bad checksum or an invalid load. ?.?? indicates that firmware is not loaded.
Response description:	Ethernet protocol firmware version-controller firmware version-updated firmware version↵		
Example:	Øq		

Description — * indicates the version running — Upload date and time

1.23-1.ØØ(1.68-FOMX Series -Wed, 2Ø Feb 2ØØ8 ØØ:ØØ:ØØ GMT)-1.ØØ*(1.Ø6-FOMX Series -Mon, 17 Mar 2ØØ7 16:39:21 GMT)↵

Ethernet protocol firmware — Fiber Matrix firmware version — Updated firmware version

NOTE:
- [X4] = SFP or reclockable output number — Ø1 – 32 or 72
- [X5] = Output reclocking rate — ØØ = Bypass mode; Ø1 = Automatic mode (HDSDI boards only); Ø2 = 1.250 Gbps (laser boards only); Ø3 = 2.125 Gbps (laser boards only); Ø4 = 4.250 Gbps (laser boards only)
- [X15] = Number (quantity) of inputs — 8, 16, 24, 32, 4Ø, 48, 56, 64, or 72
- [X16] = Number (quantity) of outputs — 8, 16, 24, 32, 4Ø, 48, 56, 64, or 72
- [X17] = Board installed — Ø = No board installed; 1 = Non-reclocking multimode board; 2 = Non-reclocking singlemode board; 3 = 3G, SDI, HD-SDI board; 4 = Non-pathological multimode board; 5 = Non-pathological singlemode board; 6 = Pathological singlemode board; X = Unknown board or mix of transceivers
- [X18] = I/O board slot number — 1 – 9 (FOX Matrix 7200) or 1 – 4 (FOX Matrix 3200)
- [X19] = Transceiver module installed — Ø = No module installed; 1 = Non-pathological multimode module; 2 = Non-pathological singlemode module; 3 = 3G-SDI, HD-SDI, SD-SDI module; 4 = Pathological singlemode module
- [X20] = Transceiver module number — Ø1 – 72 (or maximum number of transceiver modules for your configuration)
- [X21] = Vendor or manufacturer name
- [X22] = Transmit output power in milliwatts
- [X23] = Receive optical power in milliwatts
- [X24] = SFP temperature — Degrees Celsius
- [X25] = Firmware version number to second decimal place (x.xx)
- [X26] = Verbose firmware version-description-upload date and time. See above.

Command and Response Table for SIS Commands (continued)

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
Information requests (continued)			
Request system status	S		
FOX Matrix 3200 Response:		X27•X27•X27•X27•X27•X27•X27•X28•X29•X29↵	
FOX Matrix 7200 Response:		X27•X27•X27•X27•X27•X27•X27•X28•X29•X29•X29•X29↵	
*Response description (***FOX Matrix 3200***):*			
+3.3V•+5V•+1.3V•+1.2V•+12V (fan volts)•+12V (redundant PS)•+12V (primary PS)•Temp•Fan 1 RPM•Fan 2 RPM↵			
*Response description (***FOX Matrix 7200***):*			
+3.3V•+5V•+1.3V•+1.2V•+12V (fan volts)•+12V (redundant PS)•+12V (primary PS)•Temp•Fan 1 RPM•Fan 2 RPM•Fan 3 RPM•Fan 4 RPM↵			
*Example (***Matrix 3200***):*	S	3.27•4.95•1.28•1.22•12.ØØ•12.Ø6•12.12•+ØØ8Ø.6Ø•ØØ3Ø13•Ø2860↵ 3.3 V power system at 3.27 V Backplane receiving 12.00 V Internal temperature 80.6° F Fan 1 rotating at 3,013 RPM	

NOTE:	X27 = Voltage	Positive or negative voltage and magnitude
	X28 = Switcher temperature	Degrees Fahrenheit
	X29 = Fan speed	In revolutions per minute (RPM)

Command and Response Table for IP- and SNMP-Specific SIS Commands

Symbol definitions

X40 = Matrix name (Up to 24 alphanumeric characters)

NOTE: The HTML language reserves certain characters for specific functions (see **Special Characters** on page 70).

X41 = Default name
Matrix 3200 — FOX-Matrix-3200- + last 3 pairs of MAC address
Matrix 7200 — FOX-Matrix-7200- + last 3 pairs of MAC address

X42 = Time and date (for set)
In the format: MM/DD/YY•HH:MM:SS where:
MM = month: 01 (January) through 12 (December)
DD = day: 01 through 31
YY = year: 00 through 99
HH = hour: 00 through 23
MM = minutes: 00 through 59
SS = seconds: 00 through 59

X43 = Time and date (for read)
In the format: Day,•DD•Mmm•YYYY•HH:MM:SS where:
Day = weekday: Mon through Sun
DD = date: 01 through 31
Mmm = month: Jan through Dec
YYYY = year: 2000 through 2099
HH = hour: 00 through 24
MM = minutes: 00 through 59
SS = seconds: 00 through 59

X44 = GMT offset
–12.0 through +14.0. Hours and minutes removed from GMT

X45 = Daylight Saving Time
0 = Daylight Saving Time off or ignore
1 = Daylight Saving Time on (North America)
2 = Daylight Saving Time on (Europe)
3 = Daylight Saving Time on (Brazil)

X46 = IP address
###.###.###.###

X47 = Hardware (MAC) address
##-##-##-##-##-##

X48 = Number of open connections
0 – 255

X49 = Password
12 alphanumeric characters

NOTE: The HTML language reserves certain characters for specific functions (see **Special Characters** on page 70).

X50 = Domain name
Standard domain name rules apply (for example: *xxx*.com)

NOTE: The HTML language reserves certain characters for specific functions (see **Special Characters** on page 70). The @ character is acceptable only as the lead-in to the domain name (such as @extron.com).

X51 = Email account 1 through 5
65 – 69. 65 = email recipient 1, 66 = 2, 67 = 3, ... 69 = recipient 5

X52 = Email address
Typical email address format (for example: *nnnn@xxx*.com)

X53 = Notification selections, part 1
I = inputs
F = fans
P = power supply

X54 = Notification selections, part 2
If X53 = I, then X54 = 00 (all inputs), or 01 through 32 (72) (input 1 through 32 [72])
If X53 = F, then X54 = 00 (all fans)
If X53 = P, then X54 = 00 (both power supplies).

X55 = Notify when?
0 = no response
1 = fail or missing
2 = fixed or restored
3 = both 1 & 2
4 = suspend

X56 = DHCP and SNMP
0 = off or disable
1 = on or enable

X57 = Port #
00 (all ports), 01 (rear panel), 02 (front panel), 03 – 99

X58 = Baud rate
9600, 19200, 38400, 115200

X59 = Parity
odd, even, none, mark, space (Only the first letter required.)

X60 = Data bits
7, 8

X61 = Stop bits
1, 2

X62 = Port type
0 = RS-232
1 = RS-422

X63 = Verbose mode
0 = clear or none (default for Telnet connection)
1 = verbose mode (default for RS-232/RS-422)
2 = tagged responses for queries
3 = verbose mode and tagged for queries

NOTE: If tagged responses are enabled, all read commands return the constant string and the value as the set command does (for example, the read matrix name command, Esc CN ← returns Ipn•X40 ↵).

X64 = Port timeout (10-sec. increments) 1 (= 10 seconds) – 65ØØØ (default is 3Ø = 300 seconds = 5 minutes)

X65 = SMNP port number ØØØØØ (= disable) – *nnnnn*. Default = ØØ161. Leading zeroes are not necessary for entry.

X66 = SNMP contact name and location Up to 64 alphanumeric characters. Default = Not•Specified.

X67 = SNMP community name Up to 64 alphanumeric characters.
Default = public (for read community) or private (for read-write community).

X68 = Trap target 1 – 3

X69 = SNMP trap version 2 or 3, or Ø = empty (**default**) if no target set

X70 = SNMP target 1 through 3 7Ø – 72. 7Ø = SNMP target 1, ... 72 = target 3

Command and Response Table for IP- and SNMP-Specific SIS Commands

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
IP setup commands			
Set matrix name	Esc X40 CN ←	Ipn• X40 ↵	
Read matrix name (location)	Esc CN ←	X40 ↵	
Reset matrix name to factory default	Esc • CN ←	Ipn• X40 ↵	"FOX-Matrix-3 (7)-" plus the last 3 pairs of the MAC address.
Set time and date	Esc X42 CT ←	Ipt X42 ↵	
Read time and date	Esc CT ←	X43 ↵	
Set GMT offset	Esc X44 CZ ←	Ipz X44 ↵	In the command, the divider between hours and minutes can be either a colon or a period. In the response, the divider is a colon.
Example:	Esc 8.3CZ ←	Ipz+Ø8:3Ø ↵	8.3 = 8:30
Read GMT offset	Esc CZ ←	X44 ↵	
Set Daylight Saving Time	Esc X45 CX ←	X45 ↵	
Read Daylight Savings Time	Esc CX ←	X45 ↵	
Set IP address	Esc X46 CI ←	Ipi X46 ↵	
Read IP address	Esc CI ←	X46 ↵	
Read hardware address	Esc CH ←	X47 ↵	Reads MAC address.
Read # of open connections	Esc CC ←	X48 ↵	
Set subnet mask	Esc X46 CS ←	Ips X46 ↵	
Read subnet mask	Esc CS ←	X46 ↵	
Set gateway IP address	Esc X46 CG ←	Ipg X46 ↵	
Read gateway IP address	Esc CG ←	X46 ↵	
Set administrator password	Esc X49 CA ←	Ipa• X49 ↵	
Read administrator password	Esc CA ←	X49 ↵	
Reset (clear) administrator password	Esc • CA ←	Ipa• ↵	
Set user password	Esc X49 CU ←	Ipu• X49 ↵	
Read user password	Esc CU ←	X49 ↵	
Reset (clear) user password	Esc • CU ←	Ipu• ↵	
Set mail server, domainname	Esc X46 , X50 , X49 CM ←	Ipm X46 , X50 , X49 ↵	
Read mail server, domainname	Esc CM ←	X46 , X50 , X49 ↵	
Set email recipient	Esc X51 , X52 CR ←	Ipr X51 , X52 , ↵	This command sets the email recipient. To receive email notifications, you must then set the events that the switcher reports, using one or more separate **Set email** (EM) SIS commands (on the next page).
Example:	Esc 69,Jsmith@folklore.netCR ←	Ipr69,Jsmith@folklore.net, ↵	
Read email recipient	Esc X51 CR ←	X52 , ↵	

Command and Response Table for IP- and SNMP-Specific SIS Commands (continued)

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
IP setup commands (continued)			
Set email events for recipient	Esc X53 X51 , X54 , X55 , Ø E M ←	Ipe X53 X51 * X54 * X55 * Ø ↵	You must first have set an email recipient for the X51 variable, using the separate **Set email recipient** (CR) command on the previous page.
Example:	Esc I69,63,3,ØEM ←	IpeI69*63*3*Ø ↵	Email account #69 (recipient #5, JSmith), will receive fail or missing and fixed or restored messages for input 63.
Read email notifications for one account (recipient)	Esc X53 X51 , X54 , Ø E M ←	X55 X55 X55 ... X55 ↵	
Set DHCP on or off	Esc X56 DH ←	Idh X56 ↵	X56: Ø = off, 1 = on
Read DHCP on or off status	Esc DH ←	X56 ↵	
Set serial port parameters	Esc X57 * X58 , X59 , X60 , X61 CP ←	Cpn X57 • Ccp X58 , X59 , X60 , X61 ↵	
Read serial port parameters	Esc X57 CP ←	X58 , X59 , X60 , X61 ↵	
Set serial port mode	Esc X57 * X62 CY ←	Cpn X57 • Cty X62 ↵	X62: Ø = RS-232, 1 = RS-422
Read serial port mode	Esc X57 CY ←	X62 ↵	
Set verbose mode	Esc X63 CV ←	Vrb X63 ↵	
Read verbose mode	Esc CV ←	X63 ↵	
Configure current port timeout	Esc Ø * X64 TC ←	PtiØ * X64 ↵	
Read current port timeout	Esc ØTC ←	X68 ↵	
Configure global IP port timeout	Esc 1 * X64 TC ←	Pti1 * X64 ↵	
Read global IP port timeout	Esc 1TC ←	X68 ↵	
SNMP setup commands			
NOTE: See **SNMP Settings Page**, on page 103. This HTML page provides introductory information about Simple Network Management Protocol (SNMP) and is the preferred method for performing the functions listed below.			
Port mapping			
Map SNMP port	Esc A X65 PMAP ←	PmapA X65 ↵	Assign a specific port. **Default**:161.
Reset SNMP port to default	Esc A161PMAP ←	PmapAØØ161 ↵	
Disable SNMP port	Esc AØPMAP ←	PmapAØØØØØ ↵	Assign no port for SNMP. Assign a valid port to enable.
View current SNMP port	Esc APMAP ←	X65 ↵	
Unit contact name and location			
NOTE: No contact or location (as opposed to Not•Specified, the default value) is not a valid entry.			
Set unit contact info	Esc C X66 SNMP ←	SnmpC * X66 ↵	Set contact info to X66.
Reset unit contact info to default	Esc C • SNMP ←	SnmpC*Not•Specified ↵	
View unit contact info	Esc CSNMP ←	X66 ↵	
Set unit location info	Esc L X66 SNMP ←	SnmpL * X66 ↵	Set location info to X66.
Reset unit location info to default	Esc L • SNMP ←	SnmpL*Not•Specified ↵	
View unit location info	Esc LSNMP ←	X66 ↵	
Community names			
Set unit read-only community name	Esc P X67 SNMP ←	SnmpP * X67 ↵	Set read-only (public) name to X67.
Reset read-only community name to default	Esc P • SNMP ←	SnmpP*public ↵	
View unit read-only name	Esc PSNMP ←	X67 ↵	
Set unit read-write community name	Esc X X67 SNMP ←	SnmpX * X67 ↵	Set read-write (private) name to X67.
Reset read-write community name to default	Esc X • SNMP ←	SnmpX*private ↵	
View unit read-write name	Esc XSNMP ←	X67 ↵	

Command Function	SIS Command (Host to Unit)	Response (Unit to Host)	Additional description
SNMP setup commands (continued)			
Access enable			
Enable SNMP access and traps	Esc E1SNMP	SnmpE*1↵	
Disable SNMP access and traps	Esc EØSNMP←	SnmpE*Ø↵	Default is disabled.
View SNMP access setting	Esc ESNMP←	X56↵	
Trap targets			
Set trap target	Esc T X67 , X68 * X46 * X69 SNMP←	SnmpT X67 , X68 * X46 * X69 ↵	
Clear trap target	Esc T X68 , ØSNMP←	SnmpT*, X68 *Ø.Ø.Ø.Ø*Ø↵	
View trap target	Esc T X68 SNMP←	X67 , X68 * X46 * X69 ↵	
Trap target notifications			
Set SNMP events for target	Esc X53 X70 , X54 , X55 , 1EM←	Ipe X53 X70 * X54 * X55 *1↵	Notify target X70 of events defined by X53, X54, and X55.
Example:	Esc F72,Ø,1,1EM←	IpeF72*Ø*1*1↵	Notify account #72 (SNMP target #3) upon any fan failure.
Read SNMP events for target	Esc X53 X70 , X54 EM←	X55 X55 X55 ... X55 *1↵	

Special Characters

The HTML language reserves certain characters for specific functions. The switcher does not accept these characters as part of preset names, name of the switcher, passwords, or locally created file names.

The following characters are not valid or not recommended:
{space (spaces **are** ok for names)} + ~ , @ = ‘ [ ] { } < > ’ “ semicolon (;) colon (:) | \ and ?.

Matrix Software

This section introduces the following software programs, which are available on the Extron website:

- **Matrix Switchers Control Program**
- **Button Label Generator Program**

Matrix Switchers Control Program

The Extron Matrix Switchers Control Program provides an easy way to set up ties and sets of ties. The program is compatible with Windows 2000, Windows XP, and later. Updates to this program can be downloaded from the Extron website.

The program communicates with the switcher via the following ports:

- **Rear panel LAN port** — A password-protected RJ-45 connection (see **Ethernet Connection** on page 13 and "Software Operation via Ethernet," below).
- **Rear panel Remote RS-232/RS-422 port** — A 9-pin D connector for serial RS-232 or RS-422 control (see **Remote port** on page 13 and **Software Operation via a Serial Port**, on the next page).
- **Front Panel Configuration port** — A 2.5 mm mini stereo jack for serial RS-232 control only (see **Front Panel Configuration Port** on page 17 and **Software Operation via a Serial Port**, on the next page).

Software Operation via Ethernet

When a matrix switcher is connected to an Ethernet WAN or LAN, up to 200 users can be connected to operate it, locally or remotely, using the Matrix Switchers Control Program (see **Ethernet Connection** on page 13 for installation details).

Connection to the switcher via the Ethernet is password protected. There are two levels of password protection:

- Administrators have full access to all FOX matrix switching capabilities and editing functions.
- Users can select inputs and outputs, set and recall presets, and view all settings with the exception of passwords.

If the same password or no password is required for logging on, all personnel log on with administrator privileges. Fields and functions that exceed user privileges are not available in the Matrix Switchers Control Program when the operator is logged on as a user.

Ethernet protocol settings

The IP Settings / Options window (see **figure 36** on page 76) provides a location for viewing and, if connected via a serial port or if logged on via the LAN port as an administrator, editing settings unique to the Ethernet interface.

Software Operation via a Serial Port

The serial ports are independent of one another. A front panel Configuration port connection and a rear panel Remote RS-232/RS-422 port connection can be active at the same time.

The default serial port protocol of both ports is as follows:

- 9600 baud
- No parity
- 8 data bits
- 1 stop bit
- No flow control

The serial ports can be configured to operate at the 9600, 19200, 38400, or 115200 baud rate but Extron recommends leaving these ports at 9600 baud only.

See the **Serial port parameters** SIS commands on page 69 to configure either port using an SIS command.

Installing the Software

The Matrix Switchers Control Program and Firmware Loader are available on the Extron website. Download and install both programs as follows:

NOTE: Steps 1 through 6, below, are also used to download firmware update packages.

1. Visit **www.extron.com** and click the **`Download`** tab (see figure 31, ❶).

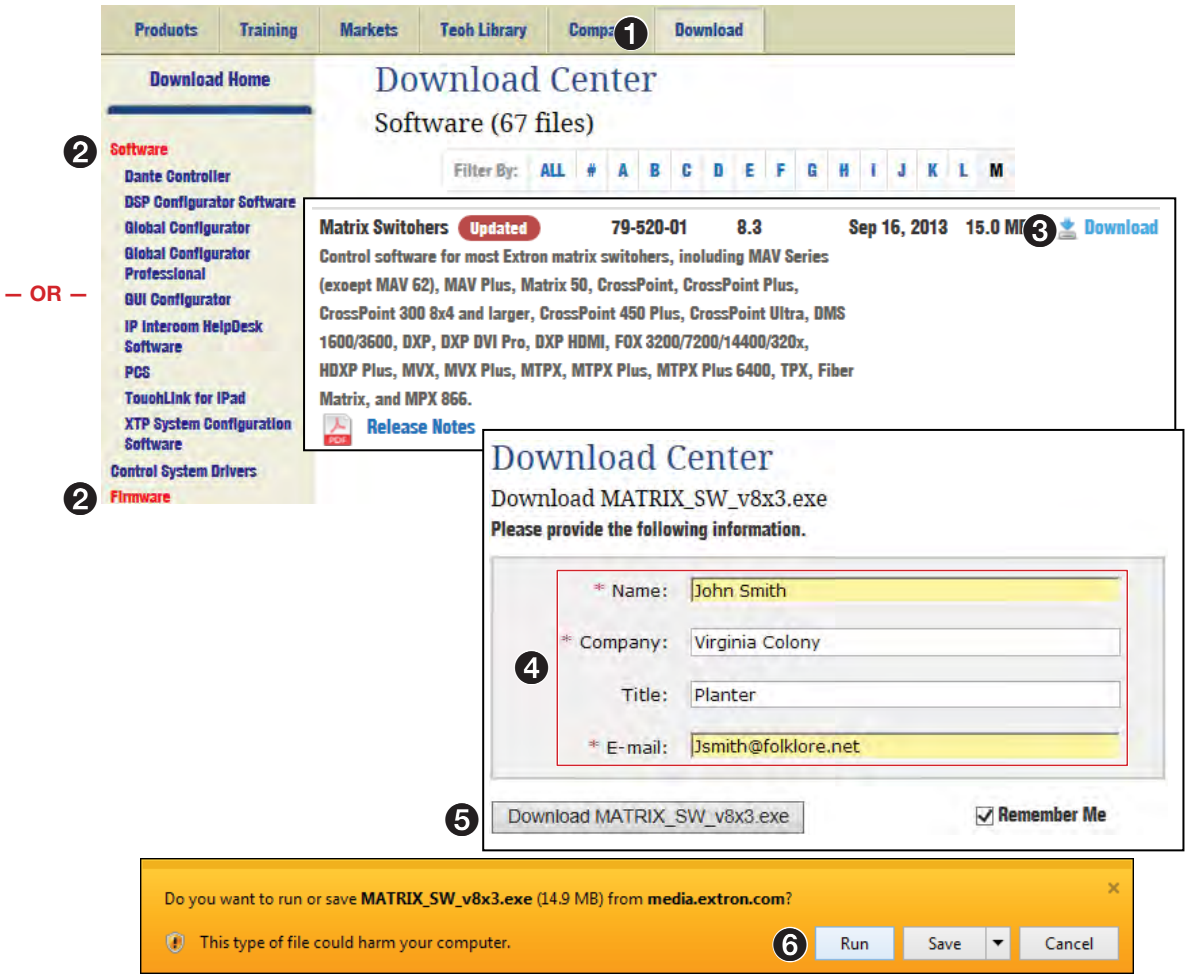

Products
Training
Markets
Tech Library
Download
Download Home
Download Center
Software (67 files)
Filter By: ALL # A B C D E F G H I J K L M
Software
Dante Controller
DSP Configurator Software
Global Configurator
Global Configurator Professional
GUI Configurator
IP Interoom HelpDesk Software
PCS
TouchLink for iPad
XTP System Configuration Software
Control System Drivers
Firmware
— OR —
Matrix Switchers Updated 79-520-01 8.3 Sep 16, 2013 15.0 MB Download
Control software for most Extron matrix switchers, inoluding MAV Series (exoept MAV 62), MAV Plus, Matrix 50, CrossPoint, CrossPoint Plus, CrossPoint 300 8x4 and larger, CrossPoint 450 Plus, CrossPoint Ultra, DMS 1600/3600, DXP, DXP DVI Pro, DXP HDMI, FOX 3200/7200/14400/320x, HDXP Plus, MVX, MVX Plus, MTPX, MTPX Plus, MTPX Plus 6400, TPX, Fiber Matrix, and MPX 866.
Release Notes
Download Center
Download MATRIX_SW_v8x3.exe
Please provide the following information.
* Name: John Smith
* Company: Virginia Colony
Title: Planter
* E-mail: Jsmith@folklore.net
Download MATRIX_SW_v8x3.exe
Remember Me
Do you want to run or save MATRIX_SW_v8x3.exe (14.9 MB) from media.extron.com?
This type of file could harm your computer.
Run
Save
Cancel
❶
❷
❸
❹
❺
❻

Figure 31. Downloading a Software or Firmware Package

2. Click the **`Software`** or **`Firmware`** link (❷) as appropriate to the operation you are performing.

3. Select the desired software or firmware file to download and click **Download** (see **figure 31** on the previous page, ❸).

   TIP: Click the desired `Filter By:` letter to jump to the correct page of downloads.

4. Enter the requested personal information (❹).

   TIP: Click **Remember Me** to eliminate step 4 in future downloads.

5. Click **Download** to copy the software or firmware to your computer (❺).
6. Click **Run** to confirm that you want to run the installation (❻).
7. **For a firmware download**, exit this procedure and return to **Updating the Firmware** on page 80 or **Firmware Upgrade Page** on page 105.
8. Follow the on-screen instructions. The installation creates a `C:\Program Files\Extron\Matrix_Switchers` directory, and it places the following four icons into a group folder named "`Extron Electronics\Matrix Switchers`":

   NOTE: The folder is `C:\Program Files(x86)\` ... for Windows 7 or Windows 8.

   - MATRIX Switcher + Control Program
   - MATRIX Switcher + Help
   - Check for Matrix Updates
   - Uninstall MATRIX Switcher

Using the Matrix Switcher Control Software

Many items found in the Matrix Switchers Control Program are also accessible via front panel controls (see **Front Panel Operations** on page 25) and under SIS control (see the **Programming Guide** section, beginning on page 52).

1. To run the Matrix Switchers Control Program, click **Start** > **Programs** > **Extron Electronics** > **Matrix Switchers** > **MATRIX Switcher + Control Pgm**.

   The `Comm Port Selection` window (see figure 32) appears.

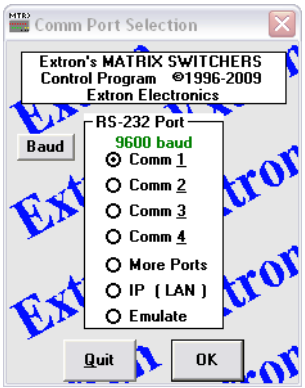
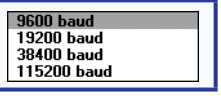


Figure 32. Comm Port Selection Window

2. Choose either the Comm port that is connected to the rear panel Remote port or front panel Config (RS-232) port, **IP [LAN]**, or **Emulate**.
   - **If you selected a comm port**, check the baud rate displayed in the comm port selection dialog box.

     NOTE: To change the baud rate, click the **Baud** button and double-click the desired baud rate. The default is 9600.

Click **OK**. The Extron Matrix Switchers Control Program window appears, displaying the current configuration of the attached matrix (see **figure 34** and **figure 35** on the next page). Proceed to step 4.

If you selected `IP [LAN]`, click **OK** and proceed to step 3.

- **If you selected `Emulate`**, click **OK** and see **Using Emulation Mode** on page 89.

3. **If you selected `IP [LAN]` in step 2**, the `IP Connection` dialog box appears (see figure 33).

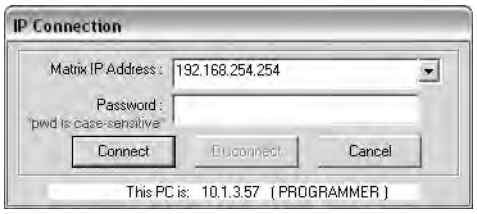


Figure 33. IP Connection Dialog Box

a. Examine the Matrix IP Address field in the `IP Connection` window. The field displays the last IP address entered.

If the IP address is correct: Proceed to step **3b**.

If the address is not correct: Either click in the **`Matrix IP Address`** field and enter the IP address or click on the scroll down button (▾) and select from among the recently used addresses. Proceed to step **3b**.

> **NOTE:** If the local system administrators have not changed the value, the factory-specified default, 192.168.254.254, is the value for this field.

b. If the switcher is password protected, click in the **`Password`** field and enter the appropriate administrator or user password.

c. Click **`Connect`**. The Extron Matrix Switchers Control Program window appears, displaying the current configuration of the attached matrix (see **figure 34** and **figure 35** on the next page). Proceed to step 4.

- If you logged on using the administrator password or if no password was required, the program connects you to the matrix switcher with all of the administrator rights and privileges. Administrators have full access to all switching capabilities and editing functions.
- If you logged on using the user password, the program connects you to the matrix switcher with only user capabilities.
- If an incorrect password was entered, the program beeps and returns to the password entry display. Users can create ties, create and recall presets, set mutes, and view all settings with the exception of passwords.

4. Operate the switcher as desired.

- To create a tie, drag an input box to one or more output boxes. To remove a tie, drag the output box to its tied input box or to the trash can.
- To make the control program easier to use, assign a device icon to each input and output. Click on a box that represents an input or output, and drag the desired icon onto the box from the icon palette that appears.
- For quick display of information on a specific input or output device, position the cursor over that device in the control program window. The program opens a window that details the connection to that device (see the inset box in **figure 35**).

> **TIP:** Print a map of the current configuration by clicking **`File`** > **`Print Tie Map`**.

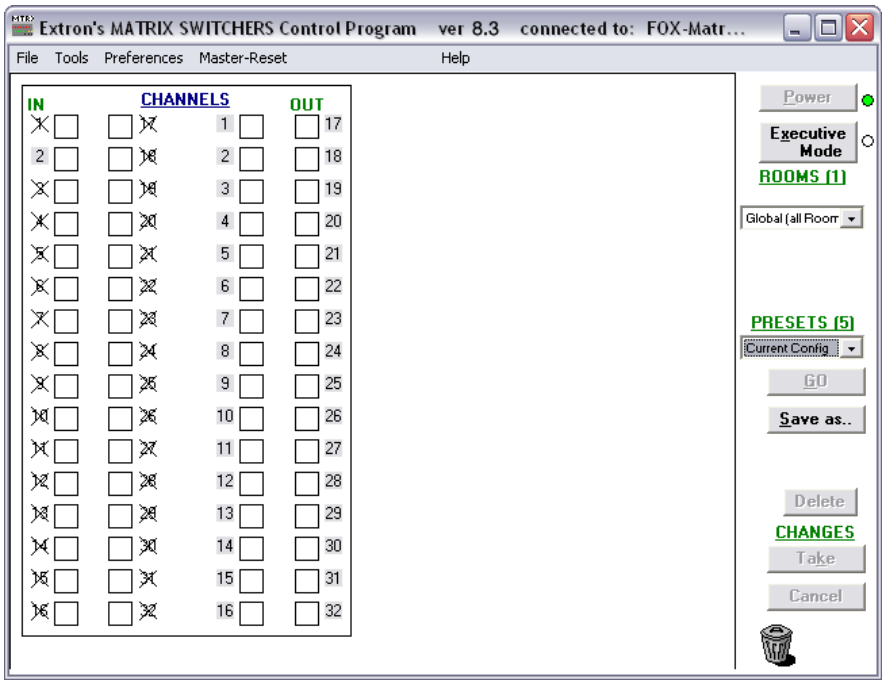


Figure 34. Extron Matrix Switchers Control Program Window (no Icons or Ties)

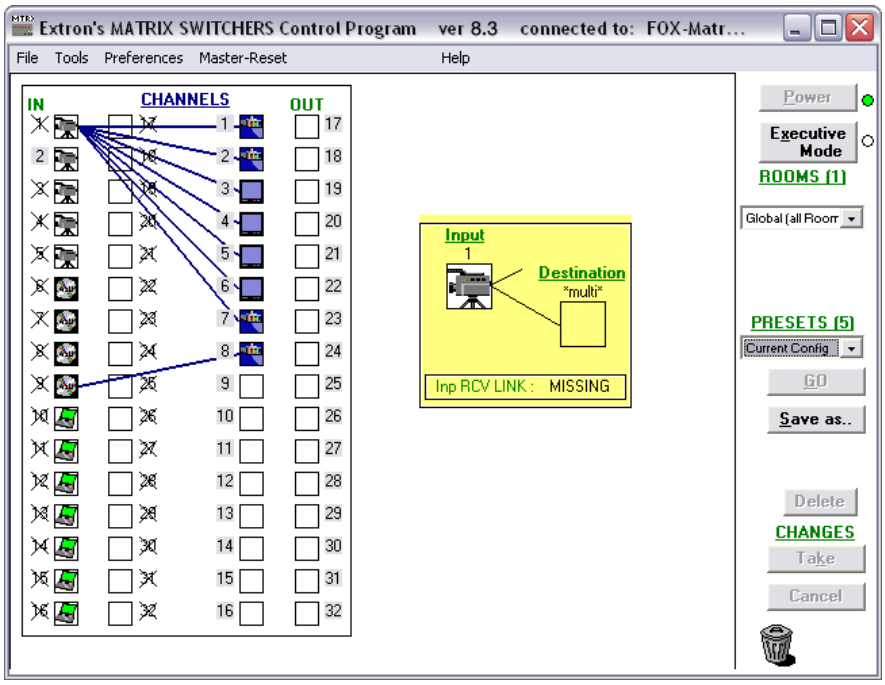


Figure 35. Sample Program Window (Icons Assigned and Ties Created)

IP Settings / Options window

The **IP Settings / Options** window (click **Tools** > **IP options**, see figure 36) provides a location for viewing and, if connected via the either serial port or if you are logged on via the LAN port as an administrator, editing settings unique to the Ethernet interface. See the **Ethernet Link** section, beginning on page 117 for basic information about IP addresses. None of the fields on this screen can be edited while you are logged on as a user.

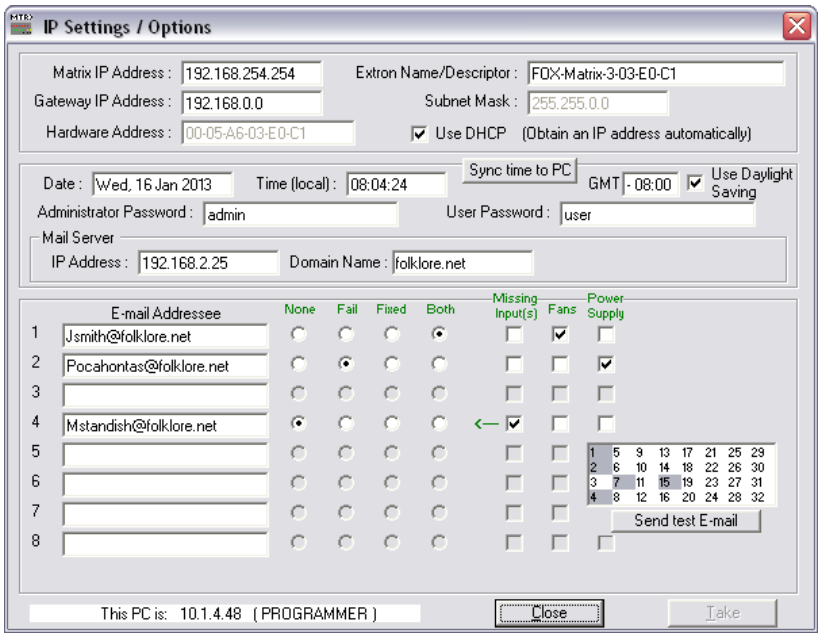


Figure 36. Control Program IP Setting/Options Window

NOTES:

- Editing variables in the IP Settings / Options window while connected via the Ethernet port can immediately disconnect the user from the switcher. Extron recommends editing the settings on this screen using a serial port and protecting the Ethernet access to this screen by assigning an administrator password to qualified and knowledgeable personnel only.
- When the control program is connected to the switcher via the RS-232 link, the **Administrator Password** and **User Password** fields are not masked. If a password has been inadvertently changed to an unknown value, you can look up and change a password in this window without knowing the current password.

Address and Name fields

- The **Matrix IP Address** field contains the IP address of the connected matrix switcher. This value is encoded in the flash memory in the switcher.
- The **Gateway IP Address** field identifies the address of the gateway to the controlling PC to be used if the matrix switcher and the mail server are not on the same subnet.
- The **Subnet Mask** field is used to determine whether the matrix switcher is on the same subnet as the controlling PC when you are subnetting. For more information, see the **Subnetting — A Primer** section on page 122.
- The **Mail Server IP Address** field displays the IP address of the mail server that handles the email for the facility in which the FOX matrix switcher is installed.

Valid addresses consist of four 1-, 2-, or 3-digit numeric subfields, properly called octets, separated by dots (periods). Each octet can be numbered from 000 through 255. Leading zeroes, up to 3 digits total per field, are optional. Values of 256 and above are invalid.

The default addresses are as follows, but if these conflict with other equipment at your installation, you can change the addresses to any valid value:

- **IP address** 192.168.254.254
- **Subnet mask** 255.255.0.0
- **Gateway address** 0.0.0.0

NOTES:

- The address fields are unavailable when the **Use DHCP** check box is selected.
- Editing the addresses while connected via the Ethernet port can immediately disconnect the user from the switcher. Extron recommends editing this field using one of the serial ports and protecting the Ethernet access by assigning an administrator password to qualified and knowledgeable personnel only.

The **Extron Name/Descriptor** field contains the name of the matrix switcher. This descriptor can be changed to any valid name, up to 12 alphanumeric characters.

The **Mail Server Domain Name** field displays the domain name that the FOX matrix switcher uses to log on to the email server. Standard domain conventions (such as *xxx*.com) apply.

NOTE: The HTML language reserves certain characters for specific functions (see **Special Characters** on page 70). In the **Mail Server Domain Name** field, the @ character is acceptable only as the lead-in to the domain name (such as *@folklore.net*).

Edit any of these fields as follows:

1. Click in the desired field. The graphic cursor becomes a text cursor.
2. Edit the address or name as desired.
3. Press the <Tab> key on the keyboard or click in another field to exit the field.
4. Click the **Take** button to make the address change take affect.

Hardware Address field

The hardware address is hardcoded in the FOX matrix switcher and cannot be changed.

Use DHCP check box

The **Use DHCP** check box directs the FOX matrix switcher to ignore any entered IP addresses and to obtain its IP address from a Dynamic Host Configuration Protocol (DHCP) server (if the network is DHCP capable). Contact the local system administrator to determine whether to use DHCP.

Date, Time (local), and GMT (offset) fields

The **Date** field displays the current date in the Greenwich Mean Time zone.

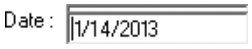
The **Time (local)** field displays the current time in the local time zone.

The **GMT** field displays the amount of time, in hours and minutes, that the local time varies from the GMT international time reference.

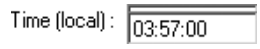
NOTE: Rather than the following procedure, you can click the **Sync Time to PC** button to set the switcher to the internal time of your computer.

If desired, adjust any of these values as follows:

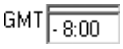
1. Click in the desired field. The field changes to an editable field appropriate to the value being changed and the graphic cursor becomes a text cursor.
   - The **Date** field becomes a set date field, with the date in the format (M)M/(D)D/YYYY. Leading zeroes are not shown.

   - The **Time (local)** field becomes a set time field, with the time in the format HH:MM:SS (00:00:00 to 23:59:59).

   - The **GMT** field becomes a set offset field, with the offset in the format ±HH:MM (–12:00 to +14:00).

2. Edit the field as desired to set the proper value. For time, remember to use 24-hour time. Leading zeroes are optional.
3. Press the <Tab> key on the keyboard or click in another field to exit the set date field.
4. Click the **Take** button to make the date change take affect.

Sync Time to PC button

Clicking the **Sync Time to PC** button causes the computer you are operating to send its internal time to the switcher in a set time command.

Use Daylight Saving check box

To turn Daylight Saving Time on and off for North America, select the **Use Daylight Saving** check box. When Daylight Saving Time is turned on, the switcher automatically updates its internal clock between Standard Time and Daylight Saving Time in the spring and fall on the date that the time change occurs in North America. When Daylight Saving Time is turned off, the switcher does not adjust its time reference.

NOTE: For Daylight Saving Time in Europe and Brazil, see the **Set Daylight Saving Time** SIS command on page 68.

Administrator Password and User Password fields

The Administrator Password field displays the password required to log on to the matrix switcher via the Ethernet port with all of the rights and privileges of the administrator. The User Password field displays the password required to log on to the matrix switcher via the Ethernet port as a user, without all of the rights and privileges of the administrator. Passwords are case sensitive and are limited to 12 upper-case and lower-case alphanumeric characters.

Both password fields are masked with asterisks (**********) as a security measure.

NOTES:

- On password-protected connections, there are two levels of protection: administrator and user. Administrators have full access to all switching capabilities and editing functions. Users can create ties, create and recall presets, set mutes, and view all settings with the exception of passwords.
- Editing the Administrator Password field while connected via the Ethernet port can immediately disconnect the user from the switcher. Extron recommends editing this field using either serial port and protecting the Ethernet access to this screen by assigning an administrator password to qualified and knowledgeable personnel only.
- An administrator password must be created before a user password can be created.
- The HTML language reserves certain characters for specific functions (see **Special Characters** on page 70).

Edit either password field as follows:

1. Click in the desired **Password** field. The pointer tool becomes a text cursor.
2. Edit the case-sensitive password as desired.
3. Press the <Tab> key on the keyboard or click in another field to exit the **Password** field.
4. Click the **Take** button to make the password change take effect.

Mail Server IP Address field

The **Mail Server IP Address** field displays the IP address of the mail server that handles the email for the facility in which the matrix switcher is installed. Standard IP protocol rules apply to the mail server IP address.

Edit this field as follows:

1. Click in the **Mail Server IP Address** field. The pointer tool becomes a text cursor.
2. Edit the IP address as desired.
3. Press the <Tab> key on the keyboard or click in another field to exit the **Mail Server IP Address** field.
4. Click the **Take** button to make the address change take effect.

Mail Server Domain Name field

The **Mail Server Domain Name** field displays the domain name that the matrix switcher uses to log on to the email server. Standard domain conventions (such as *xxx*.com) apply.

NOTE: The HTML language reserves certain characters for specific functions (see **Special Characters** on page 70). In the **Mail Server Domain Name** field, the @ character is only acceptable as the lead-in to the domain name (such as *@folklore.net*).

Edit this field as follows:

1. Click in the **Mail Server Domain Name** field. The pointer becomes a text cursor.
2. Edit the name as desired.
3. Press the <Tab> key on the keyboard or click in another field to exit the **Mail Server Domain Name** field.
4. Click the **Take** button to make the name change take effect.

E-mail Addressee fields

The five **E-mail Addressee** fields permit the administrator to identify the email addresses of the personnel to whom the FOX matrix switcher emails notification of its failure and repair status. Figure 37 shows a typical email from the switcher.

Miles Standish

From: FOX-Matrix-3-03-E0-C1@folklore.net
Sent: Wednesday, January 16, 2013 11:22 AM
To: Miles Standish
Subject: FOX-Matrix-3-03-E0-C1 - Fans restored.

Wed, 16 Jan 2013 11:22:48
Unit Name = FOX-Matrix-3-03-E0-C1
Unit IP Address = 192-168-254-254

Figure 37. Typical FOX Matrix Switcher Email

The radio buttons and check boxes associated with each address field permit the administrator to specify specific email requirements for each recipient.

Edit these fields and controls as follows:

1. Click in the desired **E-mail Addressee** field. The graphic cursor becomes a text cursor.
2. Edit the email address as desired. Standard email address conventions (for example: *nnnnn@xxx*.com) apply.
3. Press the <Tab> key on the keyboard or click in another field to exit the **E-mail Addressee** field.
4. In the square check boxes associated with each addressee, select one or more options about which the addressee is to be emailed: **Missing Input(s)**, **Fans**, and **Power Supply**. In the floating box that contains the input numbers, select the inputs to be monitored.
5. In the round radio buttons associated with each addressee, select whether the addressee is to be emailed of failures, fixes, both, or not to be notified. The **None** radio button is useful for temporarily removing personnel from the email list when they are unavailable, such as when travelling or on vacation.
6. If desired, click the **Send test E-mail** button to test the email function.
7. Click the **Take** button to make the email address changes take affect.

Updating the Firmware

The firmware upgrade utility provides a way to replace the firmware that is coded on the control board of the switcher without taking the switcher out of service.

NOTE: Upgrading the firmware does not overwrite the current configuration or presets.

Update the switcher firmware as follows:

1. Perform steps 1 through 5 of **Installing the Software**, on page 72, to download the firmware upgrade from the Extron website.
2. Click **Run** in the `File Download` and `Security Warning` dialog boxes (see **figure 38** on the next page, ❶). The PC extracts the firmware update received from the Extron website and starts the Extron Installation Program to extract the firmware file.
3. Click **Next** in the `Firmware Upgrade` window (❷). The program extracts the firmware files and places them in a folder identified in the InstallShield Wizard window.

ATTENTION:

- The firmware file must have an .s19 extension. Other file types can cause the switcher to stop functioning.
- Le firmware doit avoir une extension .S19. D'autres types de fichiers peuvent nuire au fonctionnement de l'émetteur.

NOTES:

- **Note the folder to which the firmware file is saved**. When downloaded from the Extron website, the firmware is placed in a subfolder of:
  - **Windows 7 or Windows 8**: `C:\Program Files (x86)\Extron\Firmware`
  - **Older versions**: `C:\Program Files\Extron\Firmware`
- The original factory-installed firmware is permanently available on the matrix switcher. If the attempted firmware upload fails, the switcher reverts to the factory-installed firmware.

4. Click **Finish** to exit the program (see figure 38, ❸).

File Download - Security Warning
Do you want to run or save this file?
Name: Fox_Matrix_FW2x02.exe
Type: Application, 2.42MB
From: media.extron.com
1
Run
Save
Cancel
While files from the Internet can be useful, this file type can potentially harm your computer. If you do not trust the source, do not run or save this software. What's the risk?
Internet Explorer - Security Warning
Do you want to run this software?
Name: Fox_Matrix_FW2x02.exe
Publisher: Extron Electronics
More options
1
Run
Don't Run
While files from the Internet can be useful, this file type can potentially harm your computer. Only run software from publishers you trust. What's the risk?
Firmware Upgrade - InstallShield Wizard
Extron
Firmware Upgrade
Welcome to the Extron Installation Program for the FOX Matrix Firmware Upgrade v2.02
The Extron Installation Program will install the updated firmware on your computer. To continue, click Next.
2
Next >
Cancel
Firmware Upgrade - InstallShield Wizard
Extron
Firmware Upgrade
Firmware Update
The InstallShield Wizard has successfully installed the Firmware Update. The release notes can be found at C:\Program Files\Extron\Firmware\FOX-Matrix\v2.02
View the Release Notes (Adobe Reader Required)
View the Update Install(Adobe Reader Required)
Click Finish to exit the Wizard.
3
Finish
Folder Where Firmware is Installed.

Figure 38. Downloading Firmware Upgrade Files

5. Connect the computer to either serial port (see **page 13** and **page 17**) or the LAN port (see **page 13**) of the switcher.
6. Start the Matrix Switchers Control Program and connect to the matrix switcher (see **Using the Matrix Switcher Control Software** in this chapter, steps 1 through 3, starting on page 73).
7. Click **`Tools`** > **`Update firmware...`** .
   - **If the switcher is connected via the LAN port**, the `Select Files` window appears (see figure 39). Perform "Ethernet-connected firmware upload," below.

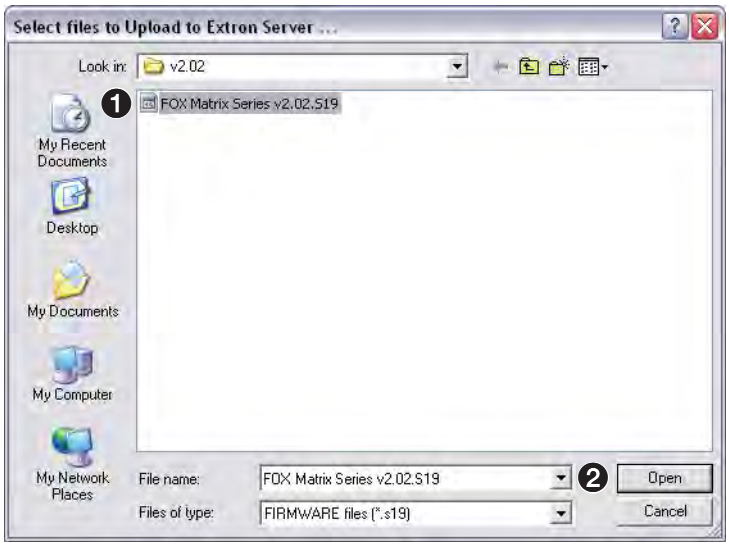


Figure 39. Select File Window

   - **If the switcher is connected via either serial port**, the Extron `Firmware Loader` window opens (see **figure 40** and **Serial-port-connected firmware upload** on the next page).

Ethernet-connected firmware upload

1. Navigate to the folder where you saved the firmware upgrade file (see figure 39, ❶). Select the file.
2. Click the **`Open`** button (❷). The software advises you that you are about to reprogram the switcher firmware. Click **`OK`** to continue.

   A status window, which shows the progress of the upload, appears. The firmware upload to the FOX matrix switcher may take a few minutes.

Serial-port-connected firmware upload

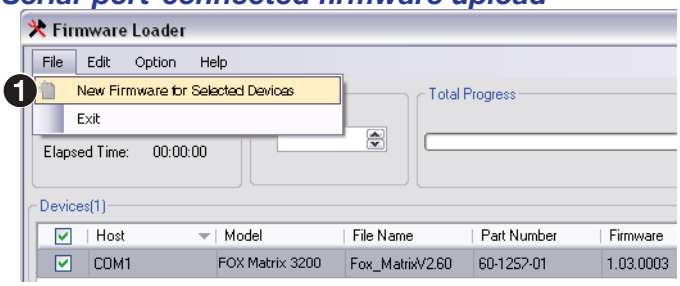


Figure 40. Extron Firmware Loader Window

1. Select the switcher and click **`File`** > **`New Firmware for Selected Devices`** (see figure 40, ❶). The `Choose Firmware File` dialog box appears (see figure 41).

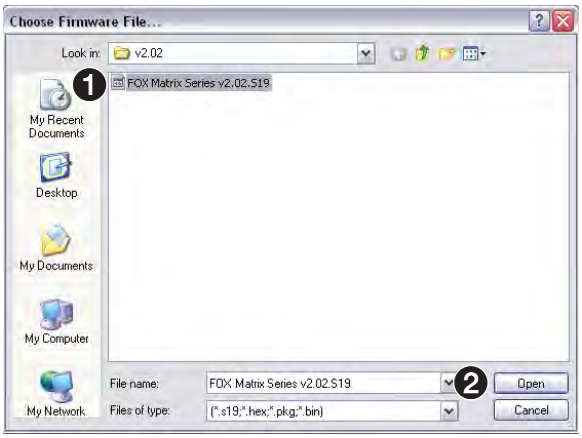


Figure 41. Choose Firmware File Window

2. Navigate to and select the new firmware file (see figure 41, ❶).
3. Click **`Open`** (❷). The `Choose Firmware File` window closes.
4. In the `Firmware Loader` window, click **`Begin`** (see ❸ on figure 42, below).

   The `Total Progress` and `Progress` status bars show the upload progress. The firmware upload may take several minutes. Once the status bars have progressed from **`Ø%`** to **`1ØØ%`**, and Status is listed as `Complete`, the firmware loader utility resets the switcher.

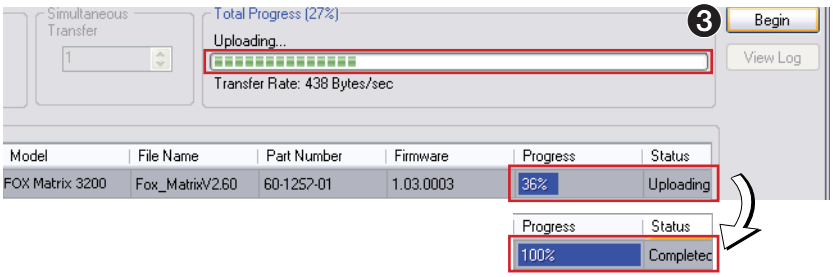


Figure 42. Firmware Loader Screen

5. Click **`Exit`** to close the Firmware Loader.

NOTE: The firmware loader increases the baud rate to 115,200. The firmware loader may not return the serial port to its earlier baud rate, making communications with the switcher impossible. If you cannot communicate with the switcher after a firmware upload, change the baud rate on your computer and, if necessary, see **Selecting the Rear Panel Remote Port Protocol and Baud Rate** on page 42.

Uploading HTML Files

You can create customized HTML pages for the switcher to display. The HTML Files List window (see figure 43) provides a way to view the contents of the file system of the switcher and to upload custom HTML pages to the switcher.

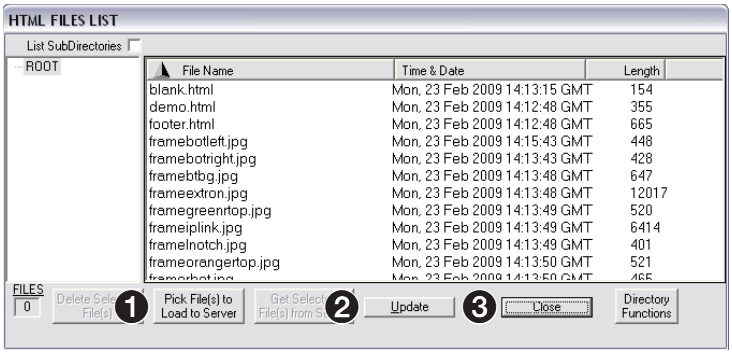

HTML FILES LIST
List SubDirectories
ROOT
File Name
Time & Date
Length
blank.html Mon, 23 Feb 2009 14:13:15 GMT 154
demo.html Mon, 23 Feb 2009 14:12:48 GMT 355
footer.html Mon, 23 Feb 2009 14:12:48 GMT 665
framebotleft.jpg Mon, 23 Feb 2009 14:15:43 GMT 448
framebotright.jpg Mon, 23 Feb 2009 14:13:43 GMT 428
framebtbg.jpg Mon, 23 Feb 2009 14:13:48 GMT 647
frameextron.jpg Mon, 23 Feb 2009 14:13:48 GMT 12017
framegreenrtop.jpg Mon, 23 Feb 2009 14:13:49 GMT 520
frameiplink.jpg Mon, 23 Feb 2009 14:13:49 GMT 6414
framelnotch.jpg Mon, 23 Feb 2009 14:13:49 GMT 401
frameorangertop.jpg Mon, 23 Feb 2009 14:13:50 GMT 521
FILES
0
Pick File(s) to Load to Server
Update
Close
Directory Functions
1
2
3

Figure 43. HTML Files List Window

NOTES:

- The files listed in figure 43 are shown for example only and may not be present on your switcher.
- The HTML Files List window is for inserting your custom HTML pages. This is not the window to replace the firmware that controls all switcher operation. See **Updating the Firmware** on page 80 to replace the firmware.
- The HTML language reserves certain characters for specific functions (see **Special Characters** on page 70).

Upload HTML pages as follows:

1. Connect the PC to the FOX matrix switcher via a serial port or the LAN port.
2. Start the Matrix Switchers Control Program and connect to the FOX matrix switcher (see **Using the Matrix Switcher Control Software**, steps 1 through 3, starting on page 73).
3. Click **`Tools`** > **`HTML File Manager`**.
4. Click the **`Pick File(s) to Load to Server`** button (see figure 43, ❶). An open file window appears.
5. Navigate to the folder where you saved the HTML file or files. Select the file or files.

   NOTES:

   - To select multiple files, hold the <Ctrl> key while you select the desired files.
   - If you want one of the custom HTML files that you created to be the default start-up page, name the file "`index.html`." The FOX matrix switcher looks for that file name when you first connect to it using an Internet browser.

6. Click the **`Open`** button. The upload of the file or files to the FOX matrix switcher may take a few minutes.
7. Click the **`Update`** button to confirm the upload (❷).
8. Click the **`Close`** button to exit the HTML Files List window (❸).

Windows Buttons, List boxes, and Trash Can

The buttons, list boxes, and trash can on the right side of the program window perform the following functions:

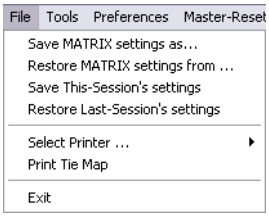
- **Power** — Unavailable for FOX matrix switchers.
- **Executive Mode** — Allows you to lock out front panel operations, except for the view-only mode functions. Click the button to cycle between locked (the indicator displays red) and unlocked (the indicator is white).
- **Room**s — Displays a list of up to 10 rooms. You can select a room from the list to display it in the window.

  NOTE: A *room* is a subset of outputs that the operator logically relate to each other. The FOX matrix switcher supports up to 10 rooms, each of which can consist of 1 to 16 outputs.

- **Presets** — Displays a list of up to 32 (FOX Matrix 3200) or 64 (FOX Matrix 7200) global presets and up to 100 room presets. You can select a preset from the list to display it in the window and either activate it (**Go**) or delete it (**Delete**).
- **Go** — Activates the selected preset as the current configuration.
- **Save as ..** — Allows the current set of ties to be saved as a preset. Enter the preset number when prompted to do so.
- **Delete** — Allows the current preset to be deleted.
- **Changes** – **Take** — Saves any changes made to the displayed configuration.
- **Changes** – **Cancel** — Abandons any changes made to the displayed configuration.
- **Trash can** — Drag and drop from an input or output button to the trash can to unmake all ties associated with that input or output.

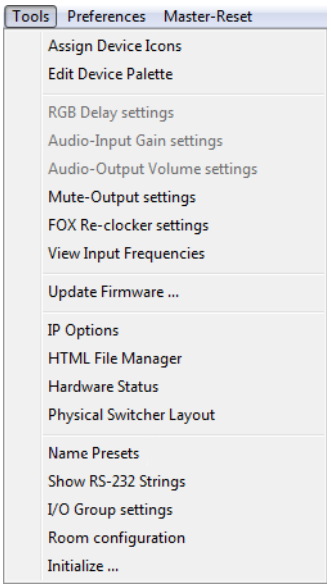
Windows menus

File menu



- **Save MATRIX settings as …** — Saves a complete set of up to 32 (FOX Matrix 3200) or 64 (FOX Matrix 7200) global presets, rooms, room presets, and preset names plus the last active setting (preset 0), to a file. Saved settings include assigned icons and icon captions.
- **Restore MATRIX settings from …** — Loads and activates a previously saved setting file.
- **Save This-Session's settings** — Saves the current assigned icons and icon captions.
- **Restore Last-Session's settings** — Loads the icons and icon captions that were saved during the last session. If you saved the changes from the previous session to disk the last time you exited the program, the ties from that session are also loaded.
- **Select Printer …** — Selects the target printer.
- **Print Tie Map** — Prints the tie set that is displayed on the screen.
- **Exit** — Closes the Matrix Switchers Control Program.

Tools menu



- **`Assign Device Icons`** — Displays the complete set of input and output device icons. You can drag any of these icons to the input and output boxes.
- **`Edit Device Palette`** — Allows you to add your own device icon graphics.
- **`Mute-Output settings`** — Displays the `Mute Adjust` window, from which you can mute each output.
- **`FOX Re-clocker settings`** — Displays the `FOX Reclocking Rate Settings` window, from which you can select the reclocking rate for one or all outputs and mute and unmute the output.
- **`View Input Frequencies`** — Displays the `Input Detection` window, which shows the data rates for SDI and HD-SDI inputs only. This selection is not available if no BNC 3G/HD/SD-SDI boards are installed.
- **`Update Firmware ...`** — Allows you to replace the firmware that is coded on the control board of the switcher without taking the switcher out of service (see **Updating the firmware** on page 80).
- **`IP Options`** — Allows you to set IP options (see **IP Settings / Options window** on page 76).
- **`HTML File Manager`** — Displays a list of HTML files installed on the switcher and allows you to upload custom files from a PC connected to the switcher (see **Uploading HTML files** on page 84).
- **`Hardware Status`** — Provides an overall view of the status of the matrix switcher, including the power supply voltages, the temperature status, the Remote RS-232/RS-422 port configuration, and the installed and updated firmware status (see figure 44).

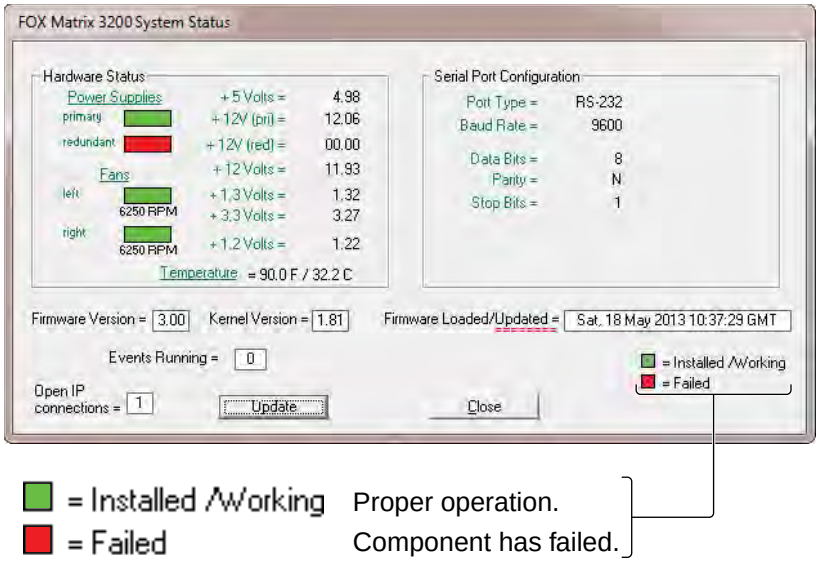


Figure 44. Status Window

- **Physical Switcher Layout** — Calls the FOX Matrix Physical Configuration window (see figure 45), which displays the I/O board type installed in each slot. The **Channels** panel can be helpful in identifying a specific input or output. In figure 45, for example, input 29 is identified as slot 4, input transceiver E (4oØ5).

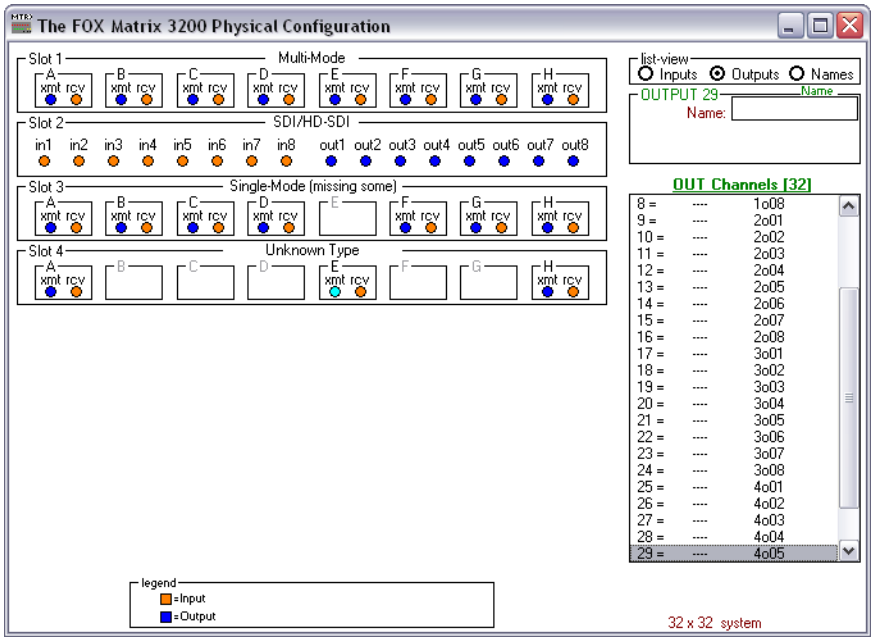


Figure 45. Physical Configuration Window

- **Name Presets** — Allows you to name each of the 32 (FOX Matrix 3200) or 64 (FOX Matrix 7200) memory presets.

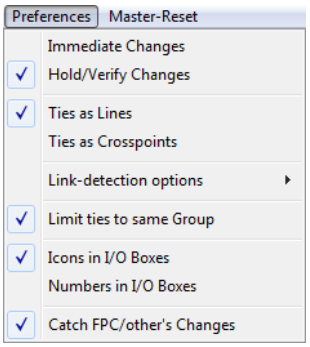
NOTE: Preset names are limited to 12 upper- and lower-case alphanumeric characters, space, and the _ and / characters. The HTML language reserves certain characters for specific functions (see **Special Characters** on page 70).

- **Show RS-232 Strings** — Displays the ASCII commands that are used by the current configuration. You can refer to these for SIS programming.
- **I/O Group settings** — Displays the inputs/outputs groups window, which allows you to assign inputs and outputs to any one of four groups (or no group).
- **Room configuration** — Allows you to assign outputs to rooms or delete outputs from rooms.

NOTE: A *room* is a subset of outputs that are logically related to each other, as determined by the operator. The FOX matrix switcher supports up to 10 rooms, each of which can consist of 1 to 16 outputs.

- **Initialize …** — Initializes and clears any or all of the following: ties, presets, preset names, icon names, and icons.

Preferences menu



- **Immediate Changes** — Causes changes to take effect immediately.
- **Hold/Verify Changes** — Delays implementation of changes until the **Changes** – **Take** button is clicked.
- **Ties as Lines** — Displays ties as lines (see figure 46).

Figure 46. Ties Shown as Lines

- **Ties as Crosspoints** — Displays ties as a matrix of inputs and outputs (see figure 47). Ties that have been made are indicated as amber boxes. Ties that will take effect when you click the Take button are indicated by +. Ties that will be broken when you click the Take button are indicated by –.

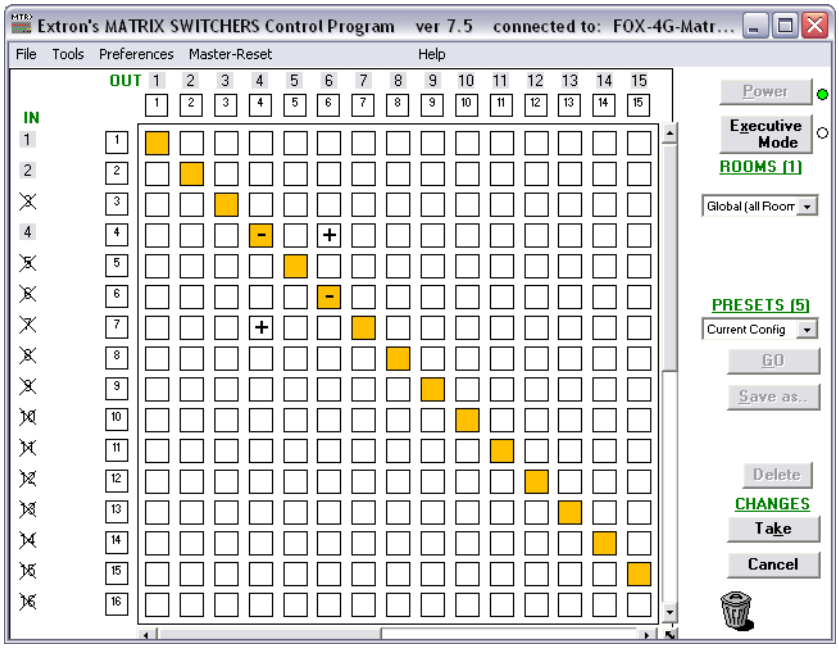


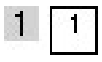
Figure 47. Ties Shown as Crosspoints

- **Link-detection options** — Allows you to set the link detection feature as follows:
  - To automatically refresh the display every 10 seconds.
  - To update the display whenever you refresh the screen.
  - To never sample and display the link status

NOTE: For the FOX Matrix 7200, this menu selection displays as **Freq/Link-detection options**.

- **Limit ties to same Group** — Allows you to limit tie creation using the program to inputs and outputs that are in the same group (similar to front panel operation).
- **Icons in I/O Boxes** — Erases any numbers in the I/O boxes in either the ties-as-lines window display (see **figure 34** on page 75) or the ties-as-crosspoints display (see figure 47, above). You can place icons in the boxes.

- **Numbers in I/O Boxes** — Erases any icons in the I/O boxes in either the ties-as-lines window or the ties-as-crosspoints display, and fills each box with the associated input or output number.



- **`Catch FPC/other's Changes`** — When checked, sets the switcher to report all configuration and setting changes to the serial port or Ethernet connection that turned this selection on. These reports allow the Matrix Switchers Control Program to track the changes that occur in the configuration and settings of the switcher, whether commanded via the front panel, a serial port, or the Ethernet port.

Master-Reset selection

Master-Reset

Master reset performs all of the following functions:

- Clears all ties
- Clears all presets
- Clears all rooms
- Clears all output mutes
- Resets all I/O grouping

NOTE: Master reset does not reset the Internet protocol (IP) settings.

Using Emulation Mode

Emulation mode allows you to set up the software without connecting the switcher. Use emulation mode as follows:

1. To run the Matrix Switchers Control Program, click **`Start`** > **`Programs`** > **`Extron Electronics`** > **`Matrix Switchers`** > **`MATRIX Switcher + Control Pgm`**.

   MTRX
   MATRIX Switcher+ Control Pgm

   The `Comm Port Selection` window (see figure 48) appears.

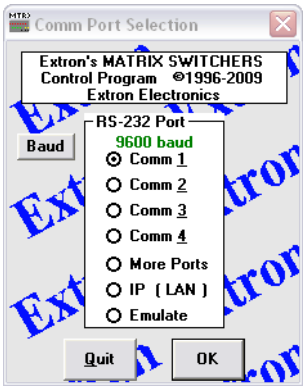


Figure 48. Comm Port Selection Window

2. Choose **`Emulate`**, and click **`OK`**.
3. Choose an emulation file to open, and click **`OK`**. The file DEMO.MTX provides a sample of a completed matrix setup. Selecting the file NEW.INI or clicking **`Cancel`** provides a blank setup window to get you started.
4. Enter the file name under which you want to save any changes to the file, and click **`OK`**.

5. Select **Fiber Matrix** as the Matrix Model, **3200** or **7200** as the Default Size, and either **singlemode** or **multimode** for each board installed (see figure 49). Click **OK**.

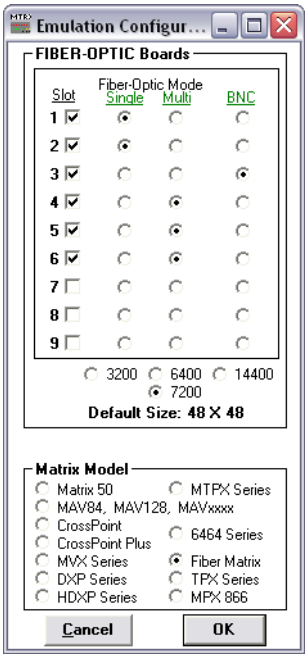


Figure 49. Emulate Mode Configuration

6. Continue using the program as described in the **Using the Matrix Switcher Control Software**, steps 1 through 3, starting on page 73).

Using the Help System

For information about program features, you can access the help program in any of the following ways:

- From the Extron Electronics program folder or group, double-click the **MTRX.HLP** icon (shown at right).
- From within the Matrix Switcher Control Program, click **Help** > **Contents** on the menu bar.
- From within the Matrix Switcher Control Program, press the <F1> key.

Button Label Generator Program

The Button Label Generator software creates labels that you can place in the translucent covers of the input and output selection buttons. You can create labels with names, alphanumeric characters, or even color bitmaps for easy and intuitive input and output selection (see the **Removing and Installing Button Labels** on page 115 for the procedure for removing and replacing the translucent covers).

Installing the Button Label Generator Software

The Extron Button Label Generator is available on the Extron website, **www.extron.com**, under the Download Center tab. Click the **Software** link (see figure 50, ❶), and download and install the program on your PC.

Figure 50. Location of Software on the Website

By default, the Windows installation creates a `C:\Program Files\Extron\ButtonLabelGenerator` directory and places the Button Label Generator icon into a group or folder named "Extron Electronics."

NOTE: `C:\Program Files(x86)\` ... for Windows 7 or Windows 8.

Using the Button Label Generator Software

1. To run the Button Label Generator program, click **Start** > **Programs** > **Extron Electronics** > **Button Label Generator** > **Button Label Generator**. The Button Label Generator window appears (see figure 51).

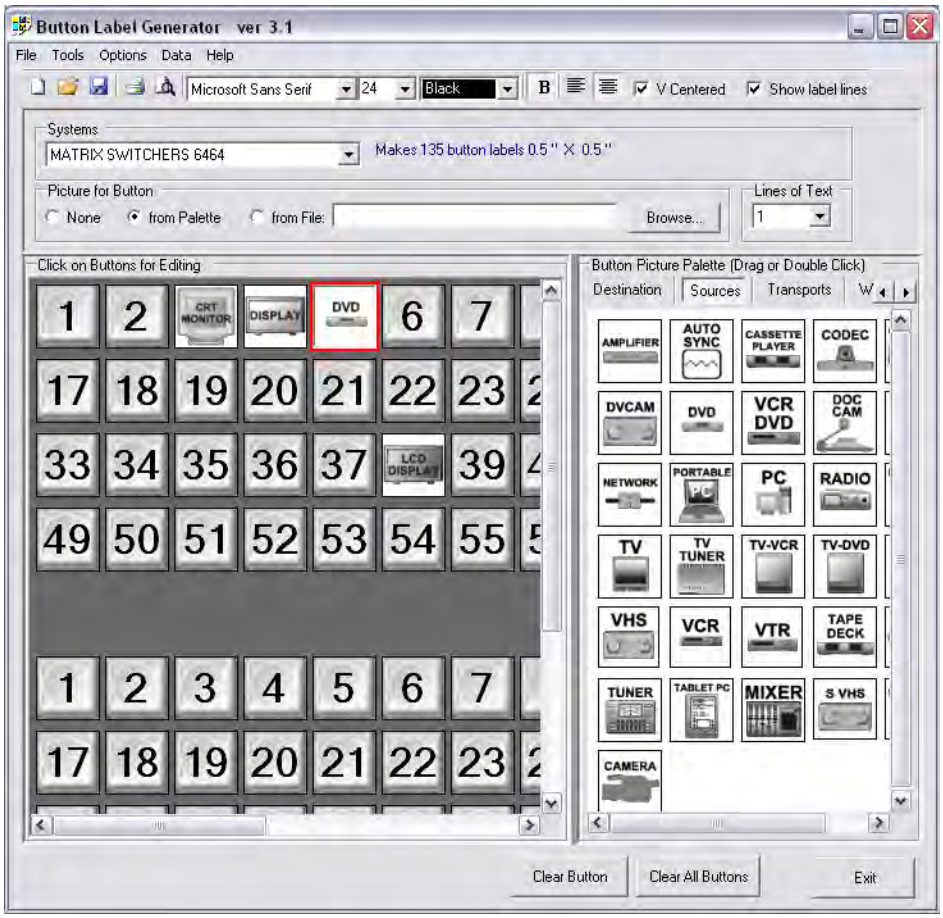


Figure 51. Extron Button Label Generator Window

2. In the **Systems** list, choose the **Matrix Switchers 6464** option to match, as closely as possible, the button label size and quantities for your FOX matrix switcher (but without buttons for 65 through 72).
3. Using normal Windows controls, you can create and print labels that can be placed in the label windows on the front panel of the switcher.

NOTE: For best results, print on transparent or translucent material.

4. Click the **Clear All Buttons** button and create new labels as many times as necessary to make all of the button labels that you need.

To access the help program, click the **Help** menu.

HTML Operation

This section introduces using the built-in HTML pages to operate the FOX matrix switchers, including:

- **Opening the Embedded Web Pages**
- **Status Tab**
- **Configuration Tab**
- **File Management Tab**
- **Control Tab**

The switcher can be controlled and operated through its LAN port, connected via a LAN or WAN, using a web browser such as the Microsoft Internet Explorer. The display in the browser of the status or operation of the switcher has the appearance of web pages. This chapter describes the factory-installed HTML pages, which are always available and cannot be erased or overwritten.

NOTE: If your Ethernet connection to the matrix switcher is unstable, try turning off the proxy server in your web browser. In Microsoft Internet Explorer, click **Tools** > **Internet Options** > **Connections** > **LAN Settings**, uncheck the **Use a proxy server...** box, and then click **OK**.

Opening the Embedded Web Pages

Access the switcher using HTML pages as follows:

1. Start the web browser.
2. Click in the **Address** field of the browser.
3. Enter the IP address in the **Address** field of the browser.

> **NOTE:** If the local system administrators have not changed the value, the factory-specified default, 192.168.254.254, is the value for this field.

4. If you want the browser to display a page other than the default page (such as a custom page that you have uploaded), enter a slash (/) and the file name to open after the IP address.

> **NOTES:**
>
> - The **Address** field of the browser should display the address in the following format: <*xxx.xxx.xxx.xxx*>/<*optional_file_name*>.html.
> - The HTML language reserves certain characters for specific functions (see **Special Characters** on page 70).

5. Press the keyboard <Enter> key. The switcher checks to see if it is password protected.

   If the switcher is not password protected, it checks and downloads the HTML pages (proceed to step 7).

   If the switcher is password protected, the switcher downloads the **Windows Security** dialog box (see figure 52).

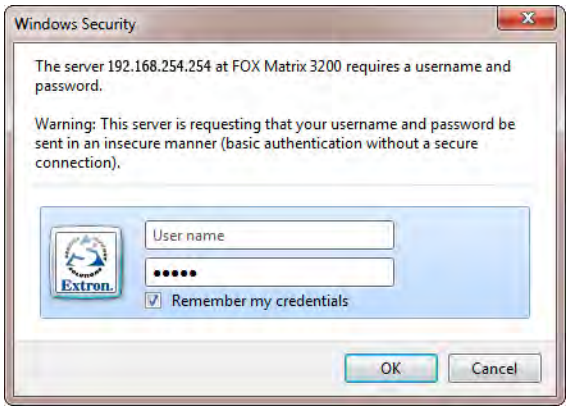

Windows Security
The server 192.168.254.254 at FOX Matrix 3200 requires a username and password.
Warning: This server is requesting that your username and password be sent in an insecure manner (basic authentication without a secure connection).
User name
Remember my credentials
OK
Cancel

Figure 52. Windows Security Dialog Box

> **NOTE:** A User name entry is not required.

6. Click in the **Password** field and type in the appropriate administrator or user password. Click the **OK** button.

7. The switcher checks several possibilities, in the following order, and then responds accordingly:
   - Does the address include a specific file name, such as `192.168.254.254/<file_name>.html`?
     If so, the switcher downloads that HTML page.
   - Is there a file in the switcher memory that is named "`index.html`"?
     If so, the switcher downloads "`index.html`" as the default startup page.
   - **If neither of the above conditions is true**, the switcher downloads the factory-installed default startup page, "`nortxe_index.html`" (see figure 53, below), also known as the System Status page.

Status Tab

System Status Page

The `System Status` page (see figure 53) provides an overall view of the status of the matrix switcher, including power supply status, individual voltages, and fan status. The `System Status` page is the default page that the switcher downloads when you connect to the switcher. Access the `System Status` page from other pages by clicking the **`Status`** tab.

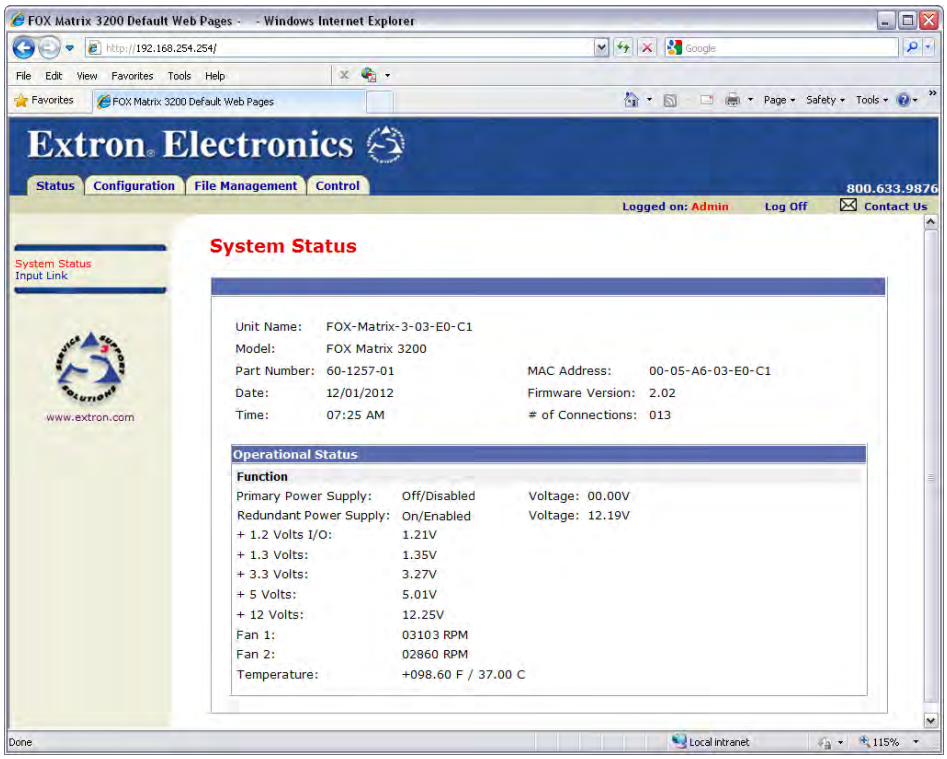


Figure 53. System Status Page

The status web page periodically refreshes to reflect the latest status of the switcher components.

Input Link page

You can view the status of each I/O board slot on the `Input Link` page (see figure 54). Click the **`Input Link`** link to the left of the Status page to download the `Input Link` page. The `Input Link` page updates itself every 30 seconds to show the latest status of installed boards, LC (fiber optic) connector installation, and input signal presence.

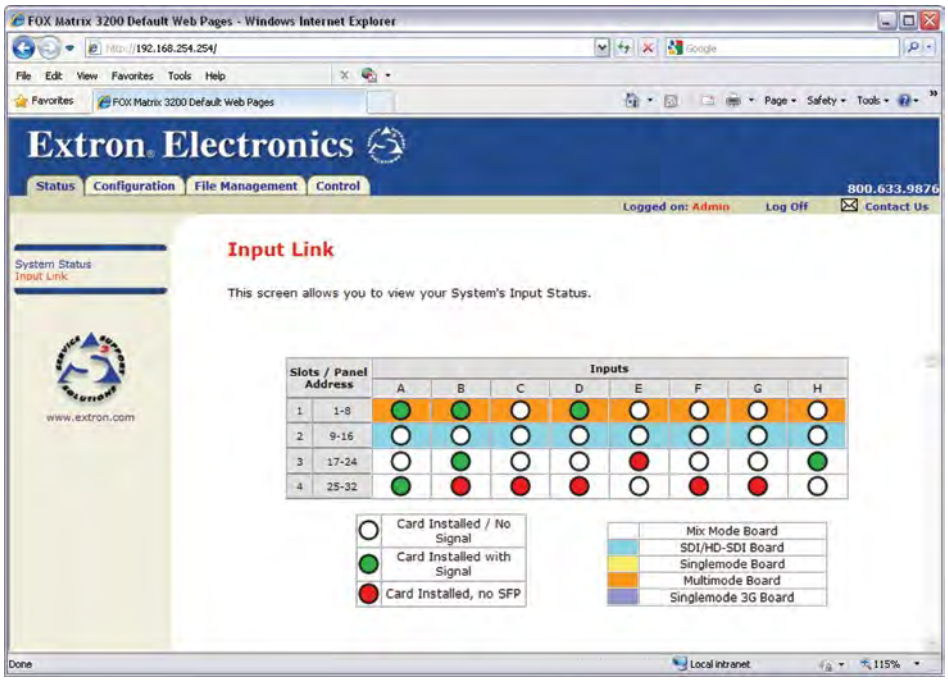


Figure 54. Input Link Page

Configuration Tab

System Settings Page

The FOX matrix switcher downloads the **System Settings** page (see figure 55) when you click the **Configuration** tab. The screen consists of fields in which you can view and edit IP administration and system settings. You can access the **Passwords**, **Email Settings**, **SNMP Settings**, and **Firmware Upgrade** pages by clicking the appropriate link. See **Ethernet Link** on page 117 for basic information about IP addresses and subnetting.

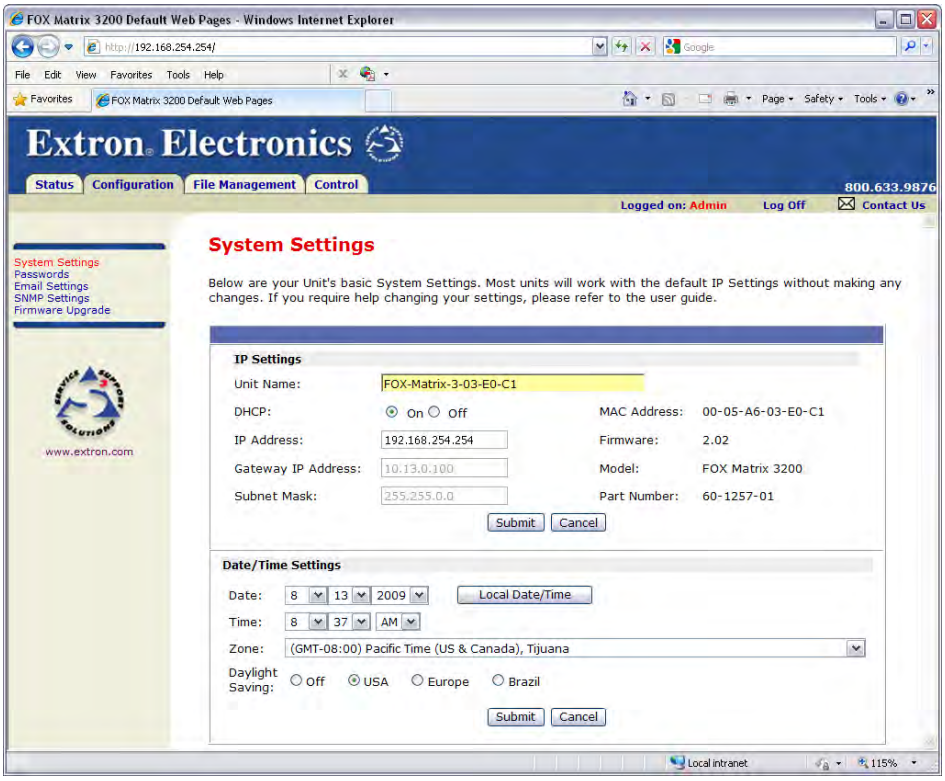


Figure 55. System Settings Page

On password-protected connections, there are two levels of protection: administrator and user. Administrators have full access to all switching capabilities and editing functions. Users can create ties, create and recall presets, set mutes, and view all settings with the exception of passwords.

IP Settings fields

The IP Settings fields provide a location for viewing and editing settings unique to the Ethernet interface. After editing any of the settings on this page, click the **Submit** button at the bottom of the page.

Unit Name field

The **Unit Name** field contains the name used as the "from" information when the switcher emails notification of its failed or repaired status. This name field can be changed to any valid name, up to 24 alphanumeric characters.

NOTE: The HTML language reserves certain characters for specific functions (see **Special Characters** on page 70).

DHCP radio buttons

The **DHCP On** radio button directs the switcher to ignore any entered IP addresses and to obtain its IP address from a Dynamic Host Configuration Protocol (DHCP) server (if the network is DHCP capable). The **DHCP Off** radio button turns DHCP off. Contact the local system administrator to determine if DHCP is appropriate.

IP Address field

The **IP Address** field contains the IP address of the connected switcher. This value is encoded in the flash memory of the switcher.

Valid IP addresses consist of four 1-, 2-, or 3-digit numeric octets separated by dots (periods). Each field can be numbered from 000 through 255. Leading zeroes, up to 3 digits total per field, are optional. Values of 256 and above are invalid.

The factory-installed default address is 192.168.254.254, but if this conflicts with other equipment at your installation, you should ask your network administrator for a new, valid address.

NOTE: IP address changes can cause conflicts with other equipment. Only local system administrators should change IP addresses.

Gateway IP Address field

The **Gateway IP Address** field identifies the address of the gateway to the mail server to be used if the switcher and the mail server are not on the same subnet.

The gateway IP address has the same validity rules as the system IP address.

Subnet Mask field

The **Subnet Mask** field is used to determine whether the switcher is on the same subnet as the mail server when you are subnetting. For more information, see **Subnetting — A Primer** on page 122.

MAC Address field

The Media Access Control (MAC) address is hardcoded in the switcher and cannot be changed.

Firmware field

The **Firmware** field identifies the installed firmware version. This field is hardcoded in the switcher and cannot be changed.

Model field

The **Model** field identifies the number of inputs and outputs. This field is hardcoded in the switcher and cannot be changed.

Part Number field

The **Part Number** field identifies the part number of your switcher. This field is hardcoded in the switcher and cannot be changed.

Date/Time Settings panel

The **Date/Time Settings** (see figure 56) provides a location for viewing and setting the time functions.

Figure 56. Date/Time Settings Panel

To sync the switcher clock to the connected PC, click the **Local Date/Time** button and then click the **Submit** button.

NOTE: Using the **Local Date/Time** button has no effect on the Zone and Daylight Savings functions.

For more complete control of the date and time settings, change the settings as follows:

1. Click the list for the variable to be changed. The adjustable variables are month, day, year, hours, minutes, AM/PM, and (time) zone. A drop-down scroll box appears (the year list is selected in figure 56).
2. Click and drag the slider or click the scroll up button or the scroll down button until the desired value is visible.
3. Click the desired value.

NOTES

- If setting the time, set the local time. The Zone variable allows you to then enter the offset from Greenwich Mean Time (GMT).
- The **Zone** field identifies the standard time zone selected and displays the amount of time, in hours and minutes, that the local time varies from the GMT international time reference.

4. Repeat steps 1 through 3 for other variables that need to be changed.
5. If appropriate, select the appropriate Daylight Saving radio button to turn on the daylight savings time feature for your region or nation.

NOTE: When Daylight Saving Time is turned on, the switcher automatically updates its internal clock between Standard Time and Daylight Saving Time in the spring and fall on the date that the time change occurs in the country or region selected. When Daylight Saving Time is turned off, the switcher does not adjust its time reference.

6. Click the **Submit** button.

Passwords Page

Access the **Passwords** page (see figure 57) by clicking the **Passwords** link on the **System Settings** page.

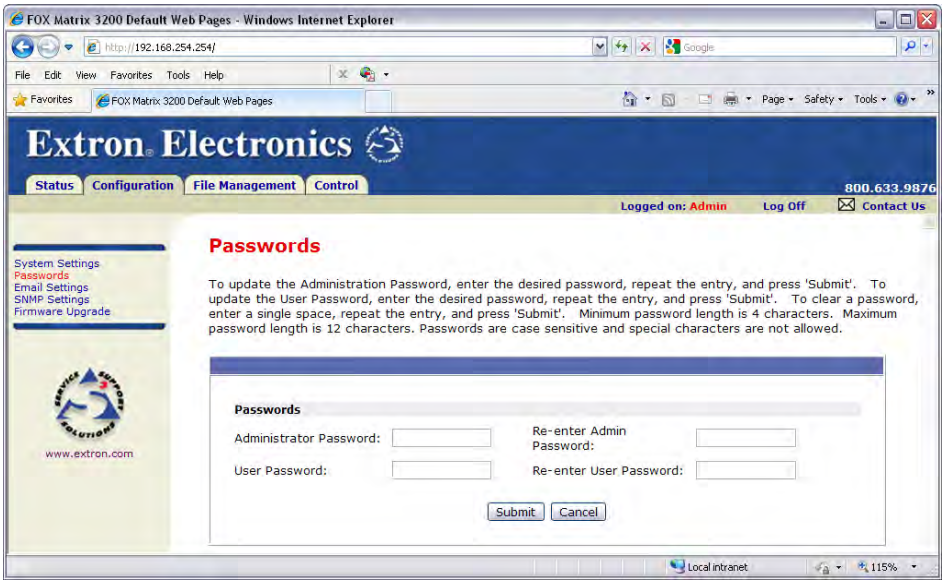

FOX Matrix 3200 Default Web Pages - Windows Internet Explorer
http://192.168.254.254/
File Edit View Favorites Tools Help
Favorites
FOX Matrix 3200 Default Web Pages
Page Safety Tools
Extron Electronics
Status
Configuration
File Management
Control
800.633.9876
Logged on: Admin
Log Off
Contact Us
System Settings
Passwords
Email Settings
SNMP Settings
Firmware Upgrade
www.extron.com
Passwords
To update the Administration Password, enter the desired password, repeat the entry, and press 'Submit'. To update the User Password, enter the desired password, repeat the entry, and press 'Submit'. To clear a password, enter a single space, repeat the entry, and press 'Submit'. Minimum password length is 4 characters. Maximum password length is 12 characters. Passwords are case sensitive and special characters are not allowed.
Passwords
Administrator Password:
Re-enter Admin Password:
User Password:
Re-enter User Password:
Submit
Cancel
Local intranet
115%

Figure 57. Passwords Page

NOTE: If the switcher is password protected, fields on this page can be edited only by personnel logged in as administrators.

The fields on the **Passwords** page are for entering and verifying administrator and user passwords. Passwords are case sensitive and are limited to as many as 12 upper-case and lower-case alphanumeric characters. Each password must be entered twice; once in the **Password** field and then again in the **Re-enter Password** field. Characters in these fields are masked by asterisks (*****). If you do not want to password protect an access level, leave the **Password** field and the **Re-Enter Password** field blank. After entering the password in both fields, click the **Submit** button.

NOTE: An administrator password must be created before a user password can be created.

Resetting a password

Reset an existing password so that no password is required as follows:

1. Clear any existing password in both the **Password** and **Re-enter Password** fields.
2. Tap the <space> bar once to enter a single ASCII space character in both the **Password** and **Re-enter Password** fields.
3. Click the **Submit** button.

Email Settings Page

Reach the **Email Settings** page (see figure 58) by clicking the **Email Settings** link on the **System Settings** page. The **Email Settings** page has fields for setting up the email notification capabilities of the switcher. For the email settings and for each row of the email notification settings, click the **Edit** button to make the fields available for editing. The button changes to **Save**. After editing the settings associated with the **Edit**/**Save** button, click the **Save** button.

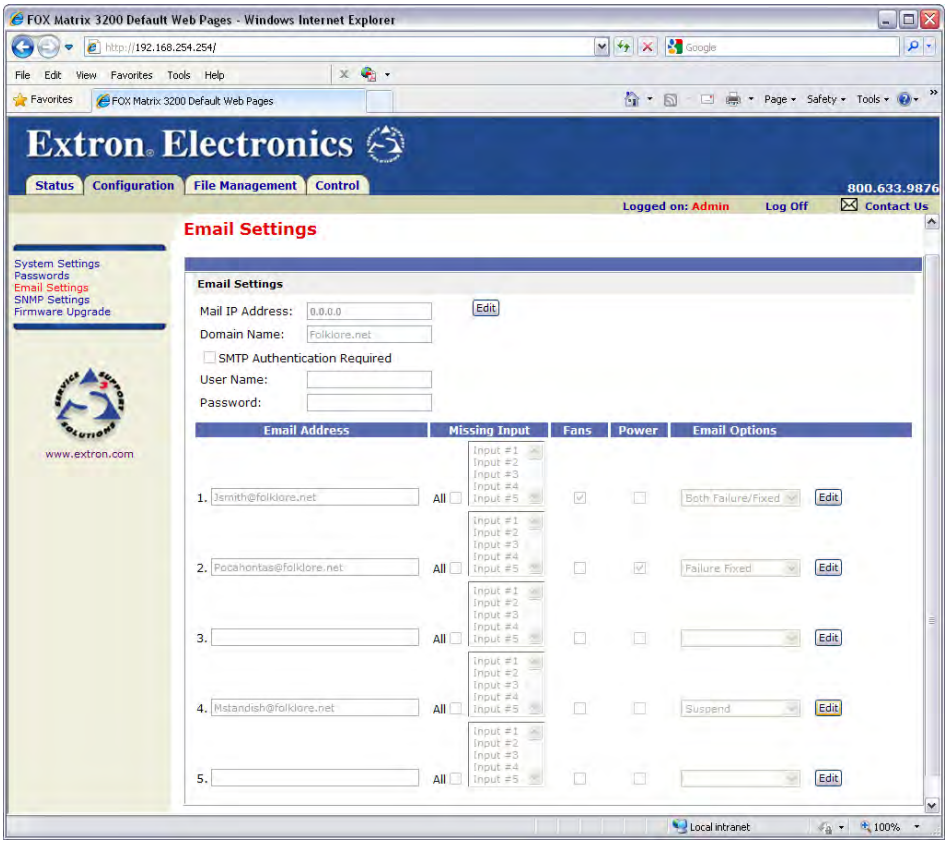


Figure 58. Email Settings Page

Mail IP Address field

The **Mail IP Address** field displays the IP address and the domain name of the mail server that handles the email for the facility in which the switcher is installed. Standard IP protocol rules apply.

Domain Name field

The **Domain Name** field displays the domain name that the FOX matrix switcher uses to log on to the email server. Standard domain name conventions (for example: *xxx*.com) apply.

NOTE: The HTML language reserves certain characters for specific functions (see **Special Characters** on page 70). The @ character is acceptable only as the lead-in to the domain name (such as @folklore.net).

Setting up SMTP authorization

If desired, set the FOX matrix switcher to require SMTP authorization before accepting any email as follows:

1. Click **Edit**. The button changes to **Save**.
2. Check the **SMTP Authorization Required** check box, located below the **Domain Name** field. This enables the **User Name** and **Password** fields below the check box.
3. Enter a user name and a password in the **User Name** and **Password** fields. For the FOX matrix switcher to accept their email messages, senders must enter the user name and password.

   NOTES:

   - For the user name, any combination of letters, numerals, spaces, and symbols except the comma (,) and the single and double quotation marks (' and ") are valid. For the password, all characters except the comma are valid. The user name and password can each be from 1 to 30 characters.
   - Both a user name and a password must be specified.

4. Click **Save** to save the user name and password.

Deselecting SMTP authorization

Remove SMTP authorization as follows:

1. Click **Edit**. The button changes to **Save**.
2. Click (deselect) the **SMTP Authorization Required** check box.
3. Click **Save**.

Email Address fields

The five **Email Address** fields identify the email addresses of the personnel to whom the FOX matrix switcher emails notification of its failure and repair status. Standard email address conventions (*nnnnn@xxx.com*) apply.

The check boxes and list boxes associated with each address field permit you to specify specific criteria under which the switcher will email recipients.

- In the associated **Missing Input** list boxes, select the inputs to monitor for presence or absence of a signal.
- Check the **Fans** and **Power** boxes to monitor the cooling and power supplies.
- In the associated **Email Options** list, select whether the recipient is to be emailed of failures, fixes, both, not notified, or to be removed from the email list. The **Suspend** option is useful for temporarily removing personnel from the email list when they are unavailable, such as when travelling or on vacation.
- Deleting an email addressee and clicking the **Submit** button removes the recipient from email notification completely.

SNMP Settings Page

NOTES:

- Simple Network Management Protocol (SNMP) is an internet-standard protocol for IT personnel to manage devices on an IP network. It is not the intent of this guide to define SNMP further than this and this section is intended for users who are familiar with SNMP protocol.
- The matrix switcher can report alarm events via an SNMP trap, providing simple integration with network management systems (NMS).
- When communicating using SNMP and generating SNMP traps (alarms and notifications), the matrix switcher complies with the requirements of SNMP v2c.
- **IT personnel** — Contact the S3 Sales & Technical Support Hotline to obtain all Extron-specific Management Information Base (MIBs). See the contact numbers on the **last page** of this guide for the Extron office nearest you.

Reach the `SNMP Settings` page (see figure 59) by clicking the **`SNMP Settings`** link on the `System Settings` page. The `SNMP Settings` page has fields for establishing the general SNMP settings and fields to establish SNMP monitoring and optional traps.

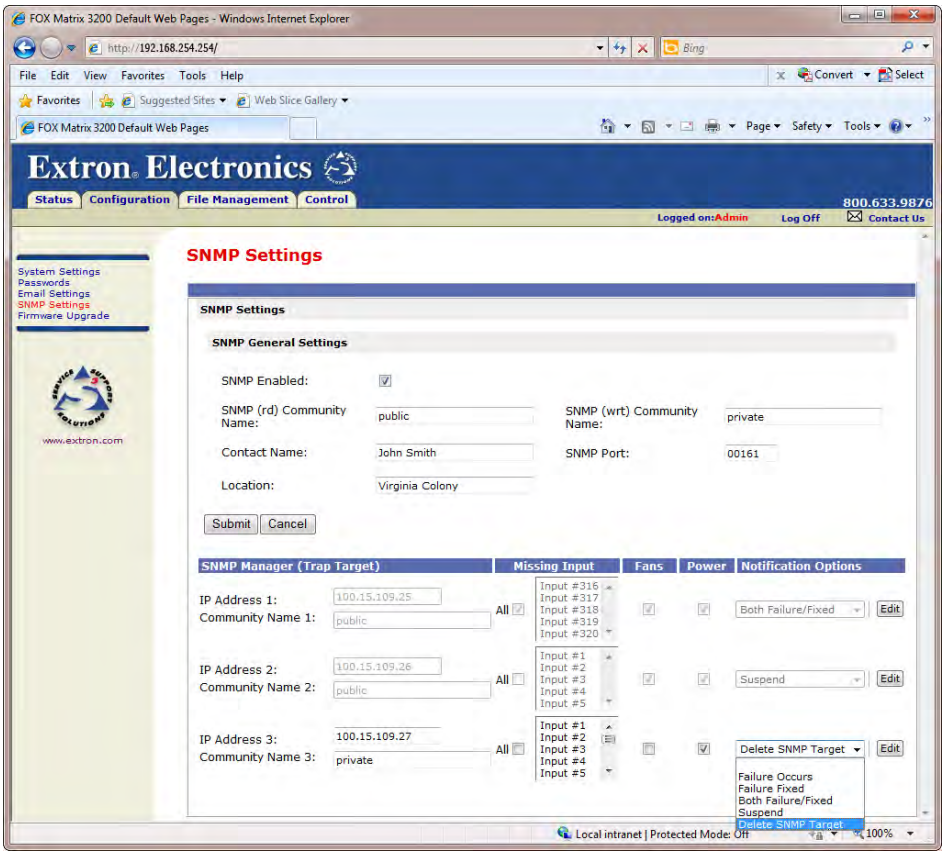


Figure 59. SNMP Settings Page

SNMP General Settings fields

To edit the SNMP General Settings fields, ensure that the **SNMP Enabled** check box is selected (SNMP is disabled by default). Click the **Submit** button to save all changes or the **Cancel** button to abandon changes.

SNMP Community Name fields — The two names are similar to passwords, granting public, read-only [SNMP (rd)] and private, read-write access [SNMP (wrt)] to the NMS. The default names are **public** and **private**.

Contact Name and Location fields — The two fields add optional information as to the location of the NMS. By default, Not Specified is assigned to the **Name** and **Location** fields.

SNMP Port field — This field identifies the port that the NMS uses to communicate with the switcher and should only be changed by IT personnel. The default port is 161.

SNMP Manager (Trap Target) fields

To edit each row of the SNMP Manager (Trap Target) settings, click the **Edit** button to make the fields available for editing. The button changes to **Save**. After editing the associated settings, click the **Save** button.

The three **IP Address** fields identify up to three NMS targets to receive trap notifications of the switcher failure and repair status or a mix of trap types to the same target.

The check boxes and list boxes associated with each IP address field permit the operator to specify specific criteria under which the switcher sends trap notifications.

- In the associated **Missing Input** list boxes, select the inputs to trap the presence or absence of a signal.
- Check the **Fans** and **Power** boxes to trap the fans and power supplies.
- In the associated **Notification Options** list, select whether to notify the target of failures, fixes, both, not notified, or to remove the target from trap list (select **Delete SNMP Target**). The **Suspend** option is useful for temporarily removing NMS stations from the notification list when they are unavailable.

Firmware Upgrade Page

The `Firmware Upgrade` (see figure 60) page provides another way to replace the firmware that is coded on the control board of the switcher without taking the switcher out of service. Access the page by clicking the **`Firmware Upgrade`** link on the `System Settings` page.

Figure 60. Firmware Upgrade Page

Update the switcher firmware as follows:

NOTE: The `Firmware Upgrade` page is **only** for replacing the firmware that controls all switcher operation. To insert your own custom HTML pages, see **File Management Page**, on the next page.

1. Perform steps 1 through 5 of **Installing the Software**, on page 72, to download the firmware upgrade from the Extron website.
2. Connect the PC to the FOX matrix switcher via the LAN port of the switcher.
3. Access the FOX matrix switcher using HTML pages.
4. Click the **`Configuration`** tab (see figure 61, ❶).

Figure 61. Firmware Upgrade

5. Click the **Firmware Upgrade** link (see **figure 61** on the previous page, ❷).
6. Click the **Browse** button (❸). A Choose File to Upload dialog box appears.
7. Navigate to the folder where you saved the firmware upgrade file and select it (❹).

ATTENTION:

- The firmware file must have an .s19 extension. Other file types can cause the switcher to stop functioning.
- Le firmware doit avoir une extension .S19. D'autres types de fichiers peuvent nuire au fonctionnement de l'émetteur.

NOTES:

- When downloaded from the Extron website, the firmware is placed in a subfolder of:
  - **Windows 7 or Windows 8**: C:\Program Files (x86)\Extron\Firmware
  - **Older versions**: C:\Program Files\Extron\Firmware
- The original firmware is permanently available on the switcher. If the attempted firmware upload fails, the switcher reverts to the factory-installed firmware.

8. Click the **Open** button (❺).
9. Click the **Upload** button (❻). The firmware upload may take a few minutes.

File Management Tab

File Management Page

To delete files such as user-supplied HTML pages from the switcher or to upload your own files to the switcher, click the **File Management** tab. The switcher downloads the File Management HTML page (see figure 62).

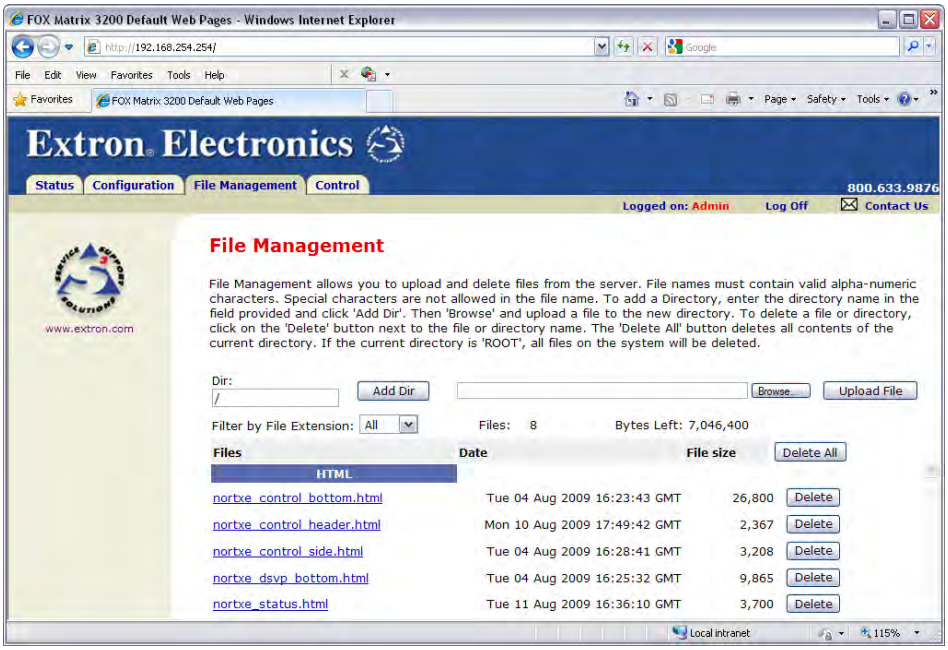

FOX Matrix 3200 Default Web Pages - Windows Internet Explorer
http://192.168.254.254/
File Edit View Favorites Tools Help
Favorites
FOX Matrix 3200 Default Web Pages
Page Safety Tools
Extron Electronics
Status
Configuration
File Management
Control
800.633.9876
Logged on: Admin
Log Off
Contact Us
www.extron.com
File Management
File Management allows you to upload and delete files from the server. File names must contain valid alpha-numeric characters. Special characters are not allowed in the file name. To add a Directory, enter the directory name in the field provided and click 'Add Dir'. Then 'Browse' and upload a file to the new directory. To delete a file or directory, click on the 'Delete' button next to the file or directory name. The 'Delete All' button deletes all contents of the current directory. If the current directory is 'ROOT', all files on the system will be deleted.
Dir:
/
Add Dir
Browse...
Upload File
Filter by File Extension:
All
Files: 8
Bytes Left: 7,046,400
Files
Date
File size
Delete All
HTML
nortxe_control_bottom.html
Tue 04 Aug 2009 16:23:43 GMT
26,800
Delete
nortxe_control_header.html
Mon 10 Aug 2009 17:49:42 GMT
2,367
Delete
nortxe_control_side.html
Tue 04 Aug 2009 16:28:41 GMT
3,208
Delete
nortxe_dsvp_bottom.html
Tue 04 Aug 2009 16:25:32 GMT
9,865
Delete
nortxe_status.html
Tue 11 Aug 2009 16:36:10 GMT
3,700
Delete
Local intranet
115%

Figure 62. File Management Page

NOTE: Figure 62 is an example only. Files shown may not be present on your switcher.

To delete a file, click the **Delete** button associated with that file.

Upload your own files as follows:

NOTE: The HTML language reserves certain characters for specific functions (see **Special Characters** on page 70).

1. Click the **Browse** button.
2. Browse through your system and select the desired file or files.

   NOTE: If you want one of the pages that you create and upload to be the default startup page, name that file "index.html".

3. Click the **Upload File** button. The file or files that you selected appear in the list.

Control Tab

Set and View Ties Page

You can create ties on the **Set and View Ties** page (see figure 63). Access the **Set and View Ties** page by clicking the **Control** tab.

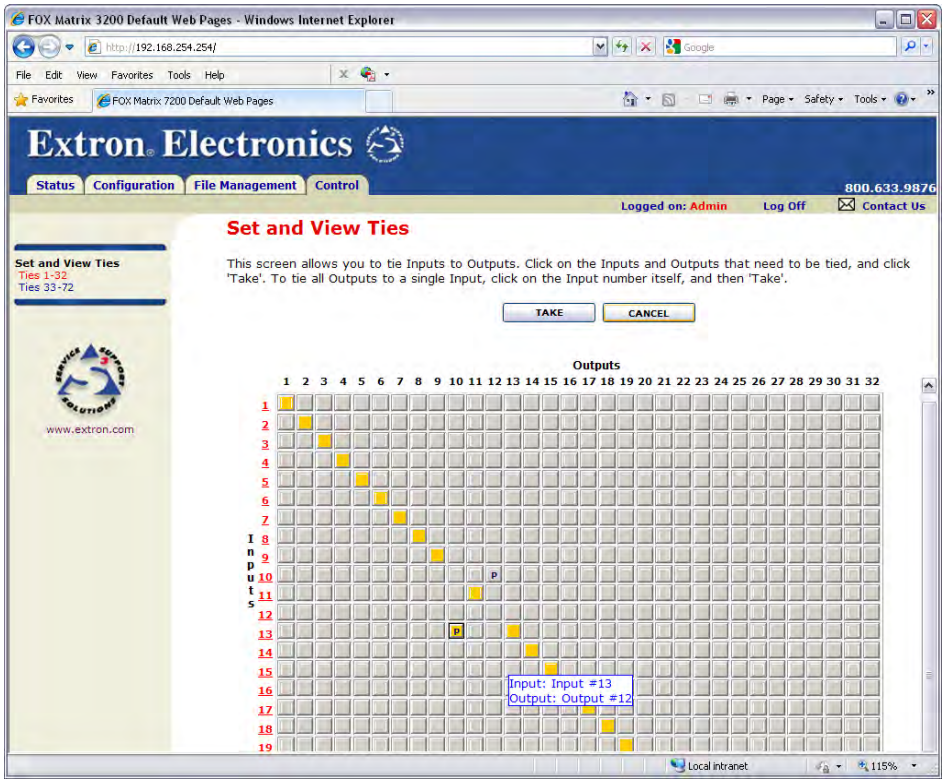

FOX Matrix 3200 Default Web Pages - Windows Internet Explorer
Extron Electronics
Status
Configuration
File Management
Control
800.633.9876
Logged on: Admin
Log Off
Contact Us
Set and View Ties
Set and View Ties
Ties 1-32
Ties 33-72
This screen allows you to tie Inputs to Outputs. Click on the Inputs and Outputs that need to be tied, and click 'Take'. To tie all Outputs to a single Input, click on the Input number itself, and then 'Take'.
TAKE
CANCEL
Outputs
Inputs
Input: Input #13
Output: Output #12
www.extron.com

Figure 63. User Control Ties Page

The page consists of a matrix of input (rows) and output (columns) buttons of two colors:

- The **amber** buttons indicate **ties**.
- The **gray** buttons indicate **no ties**.

TIP: If you lose track of the input and output associated with a specific button, let the mouse pointer rest over the button for a moment. As shown on figure 63, a field pops up that identifies the input and output numbers for that button.

Creating or deleting a tie

Make or break a tie as follows:

1. Move the mouse over the matrix of input and output selection buttons. Click a button to:
   - Create a pending tie of the input and output associated with that button
   - Create a pending untie of the input and output associated with that button

   A "P" (for pending) appears in the button.

   NOTES:
   - Because of command length limitations in the browser, you can make a maximum of 30 connections with a single **Take** command (step 2).
   - To tie an input to all outputs, click the input number for that input.

2. Click the **Take** button to make the configuration changes or the **Cancel** button to abandon the configuration changes.

Maintenance and Modifications

This section provides procedures for maintaining and modifying the FOX matrix switchers, including:

- **Mounting the Switcher**
- **Battery and Power Precautions**
- **Removing and Installing an I/O Board or Blank Panel**
- **Removing and Installing a Power Supply Module**
- **Removing and Installing a Fan Module**
- **Removing and Installing Button Labels**

ATTENTION:

- Installation and service must be performed by authorized personnel only.
- L'installation et l'entretien doivent être effectués par le personnel autorisé uniquement.

Mounting the Switcher

The FOX Matrix 3200 is housed in a rack-mountable, 4U high metal enclosure with mounting flanges for standard 19-inch wide racks. The FOX Matrix 7200 is in an 8U high enclosure.

UL Guidelines

The following Underwriters Laboratories (UL) guidelines pertain to the installation of the matrix switcher into a rack.

- **Elevated operating ambient temperature —** If the equipment is installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consider installing the equipment in an environment compatible with the maximum ambient temperature specified by Extron (Tma = +32 to +122 °F [0 to +50 °C]).
- **Reduced air flow —** Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
- **Mechanical loading —** Mount the equipment in the rack so that uneven mechanical loading does not create a hazardous condition.
- **Circuit overloading —** Consider the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Use appropriate consideration of equipment nameplate ratings when addressing this concern.
- **Reliable earthing (grounding) —** Reliable earthing of rack-mounted equipment should be maintained. Particular attention should be given to supply connections other than direct connections to the branch circuit (such as the use of power strips).

Mounting Instructions

If desired, rack mount the switcher as follows:

1. Insert the unit into the rack, aligning the mounting bracket holes with those in the rack.
2. Secure the switcher to the rack using the supplied bolts.

Battery and Power Precautions

The matrix switcher is provided with a permanently installed (factory-soldered in place) lithium battery. The battery maintains the real time clock in the event of power failure or extended storage periods and does not affect the normal operation of the switcher. If the battery becomes ineffective, return the switcher to Extron for repair.

WARNING: There is a danger of explosion if the battery is incorrectly replaced. Do not attempt to remove or replace the internal battery.

AVERTISSEMENT : Si la pile est mal remplacée, il y a un risque d'explosion. N'essayez pas de retirer ou de remplacer la batterie interne.

ATTENTION:

- This unit uses double pole/neutral fusing. Do not operate the equipment with only one power supply cord connected.
- Cette unité utilise double pôles/fusion neutre. N'utilisez pas l'équipement avec seulement un cordon d'alimentation connecté.

Removing and Installing an I/O Board or Blank Panel

WARNING: The FOX matrix switchers fiber optic I/O boards output continuous invisible light (Class 1 rated), which may be harmful to the eyes; use with caution.

- **Do not look** into the fiber optic cable connectors or into the fiber optic cables themselves.
- Plug the attached dust cap into the optical transceiver when the fiber optic cable is unplugged.

AVERTISSEMENT : Le grilles de commutation de la gamme FOX cartes d'entrée/sortie fibre optique émet une lumière invisible en continu (conforme à la classe 1) qui peut être dangereux pour les yeux, à utiliser avec précaution.

- Ne regardez pas dans les connecteurs de câble fibre optique sur le panneau arrière ou dans les câbles fibre optique eux-mêmes.
- Branchez la protection contre la poussière dans l'ensemble émetteur/récepteur lorsque le câble fibre optique est débranché.

NOTES:

- As factory configured, the fiber optic I/O boards are either 100 percent singlemode or 100 percent multimode, but you can remove a fiber optic transceiver module (one input and one output) of one transmission mode and replace it with a block of the other transmission mode.

  You can mix transmission mode transceiver modules on a fiber optic I/O board, provided that you ensure that each fiber cable and connected devices are the appropriate transmission mode for the transceiver module. Typically, singlemode fiber has a yellow jacket and multimode cable has an orange or aqua jacket.
- For proper cooling and air flow, boards or blank panels should be installed in all locations during normal switcher operations.

See figure 64. The transceiver modules on fiber optic I/O boards and the BNC connectors on SDI/HD-SDI boards are identified as A through H . Each I/O board is identified by the input and output numbers supported by the board position (1 - 8, 9 - 16, and so on).

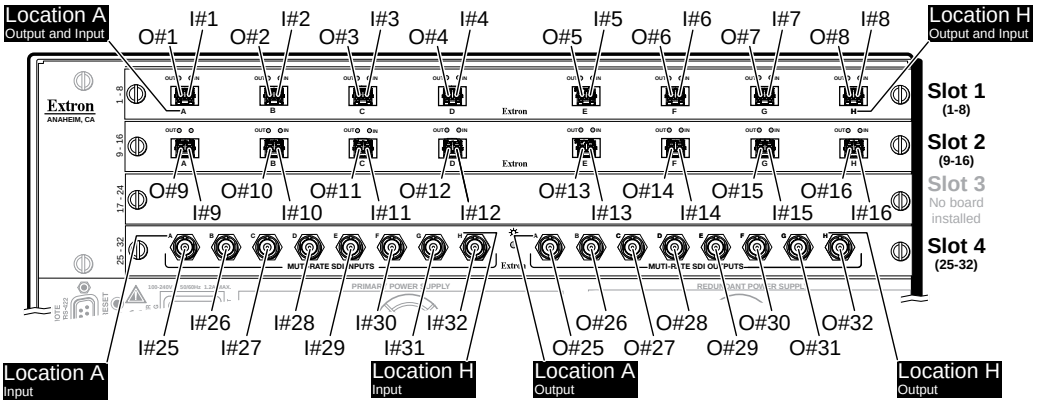


Figure 64. Arrangement of Inputs and Outputs on the I/O Boards

Slot	Inputs and Outputs	Slot	Inputs and Outputs
1	1 through 8	**5***	33 through 40
2	9 through 16	**6***	41 through 48
3	17 through 24	**7***	49 through 56
4	25 through 32	**8***	57 through 64
		9*	65 through 72

* FOX Matrix 7200 only

Locations A through H correspond to the input and output numbers identified by the board position numbers. (For example, the input and output numbers supported by the I/O board in location 9 - 16 (slot 2) are as follows: A = 9, B = 10, C = 11, D = 12, E = 13, F = 14, G = 15, and H = 16.)

On the fiber optic I/O boards, locations A through H correspond to the transceiver modules, each of which includes an input and an output. Therefore, locations A through H are numbered from left to right.

On the 3G/SDI/HD-SDI I/O boards, inputs and outputs are grouped separately, with inputs A through H on the left and outputs A through H on the right.

ATTENTION:

- Do not touch the electronic components or the connectors on the backplane or on the circuit boards without being electrically grounded. Handle circuit boards by their edges only. ESD can damage circuits, even if you cannot feel, see, or hear it.
- Ne pas toucher les composants électroniques ou les connecteurs sur la carte mère ou sur les circuits imprimés sans être électriquement relié à la terre. Manipuler les circuits imprimés en les tenant seulement par leurs bords. Cela pourrait endommager le commutation de la gamme FOX.

NOTE: The I/O boards are hot-swappable. You do not need to power down the switcher to remove or install an I/O board.

Removing an I/O Board or Blank Panel

Remove an I/O board or blank panel as follows:

1. **For an I/O board**, disconnect any connected cables.
2. Rotate the left and right knurled knobs to completely loosen the captive screws (see figure 65).

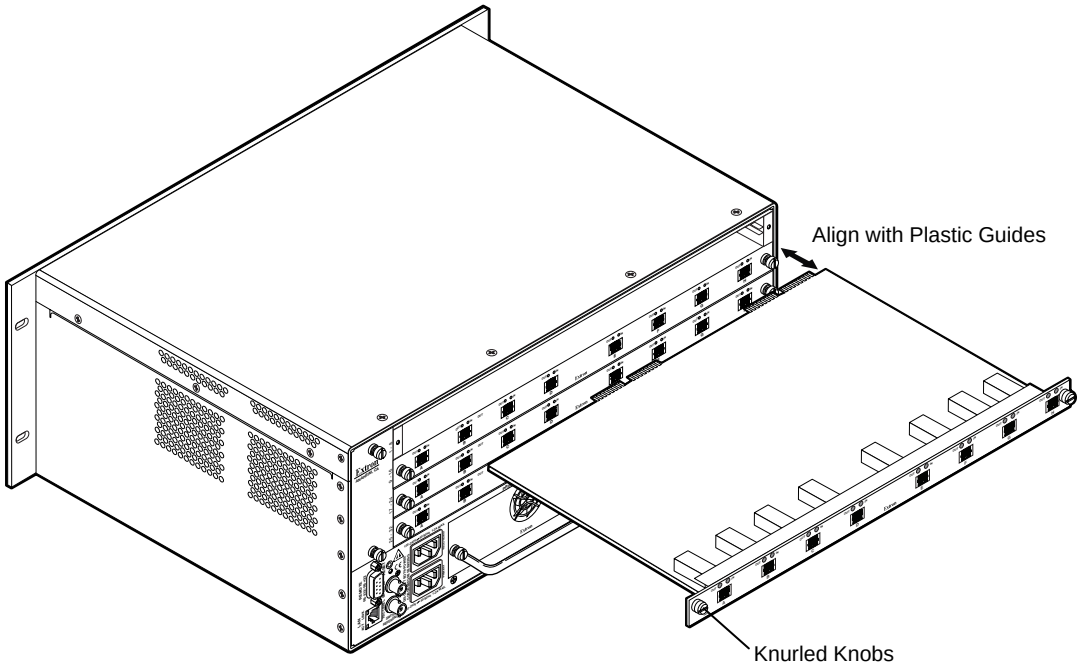


Figure 65. I/O Board Replacement

3. Gently pull on the screws to loosen the board or panel from the backplane.
4. Slide the board or panel out of the chassis.
5. Place the removed board on an antistatic surface or in an antistatic container.

Installing an I/O board or blank panel

Install an I/O board or blank panel as follows:

1. **For an I/O board**, orient the board to be installed so that transceiver module A (**fiber board**) or input BNC A (**SDI/HD-SDI board**) is on the left and transceiver module or output BNC H is on the right as you face the rear of the switcher.
2. **For an I/O board**, align the board with the left and right chassis guides (see figure 65).
3. Gently slide the board or blank panel into the enclosure. **For an I/O board**, slide the board toward the front panel until it meets resistance.
4. Gently seat the board or panel in the backplane.
5. Use a screwdriver to tighten the left and right captive screws to secure the board or panel in place.

Removing and Installing a Power Supply Module

The two (primary and redundant) power supply modules are identical. Each power supply module has a 2-color status LED, visible on the rear panel, that indicates the status of the power supply outputs. If the LED is lit green, the power supply is operating normally. If the LED is lit red, the supply has failed and should be replaced at the earliest opportunity.

NOTE: The power supply modules are hot-swappable. Either power supply can be removed of installed without powering down the switcher.

Removing the Power Supply Module

Remove a power supply module as follows:

1. Rotate the left and right knurled knobs to completely loosen the captive screws.
2. Gently pull on the handle to loosen the power supply from the backplane (see figure 66).
3. Slide the power supply out of the chassis.

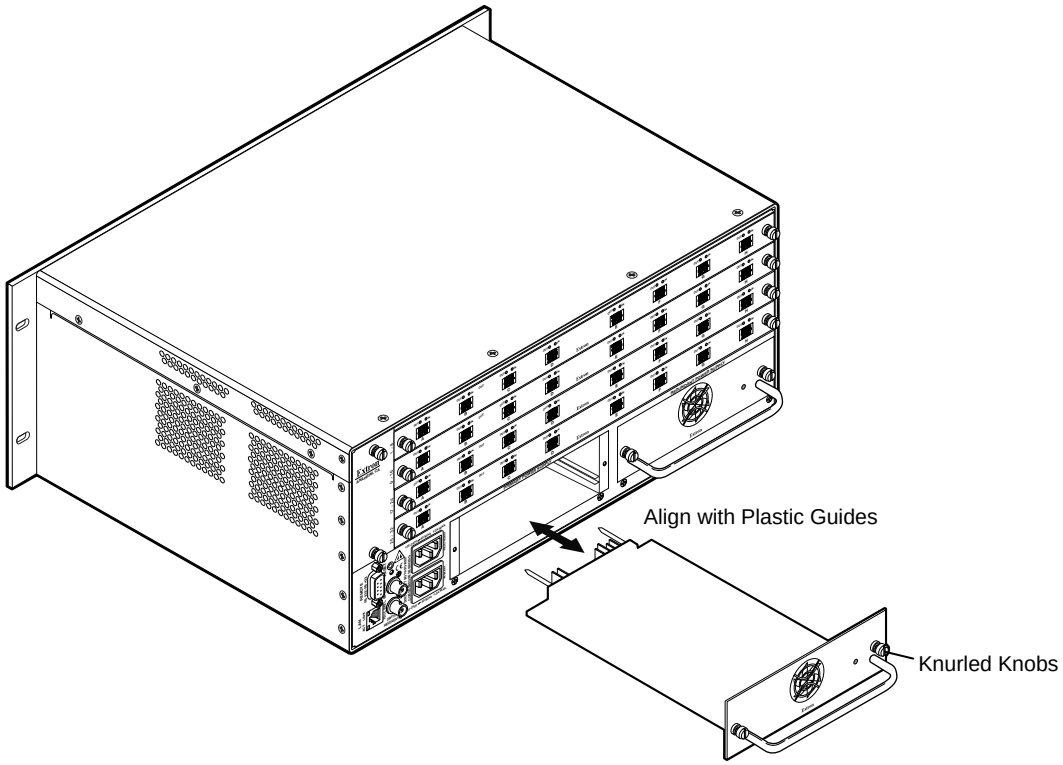


Figure 66. Power Supply Replacement

Installing a Power Supply Module

Install a power supply module as follows:

1. Orient the power supply module to be installed with the LED to the right.
2. Align the flanges on the power supply module with the left and right power supply guides (see figure 66).
3. Gently slide the power supply into the enclosure until the module meets resistance.
4. Gently seat the power supply in the backplane.
5. Use a screwdriver to tighten the left and right knurled knobs/captive screws to secure the power supply in place.

Removing and Installing a Fan Module

The FOX Matrix 3200 has one replaceable fan module; the FOX Matrix 7200 has two identical fan modules. If a fan fails, it should be replaced at the earliest opportunity.

NOTE The fan modules are hot-swappable; they can be removed or installed without powering down the switcher.

Removing a Fan Module

1. Rotate the top and bottom knurled knobs to completely loosen the captive screws (see figure 67).

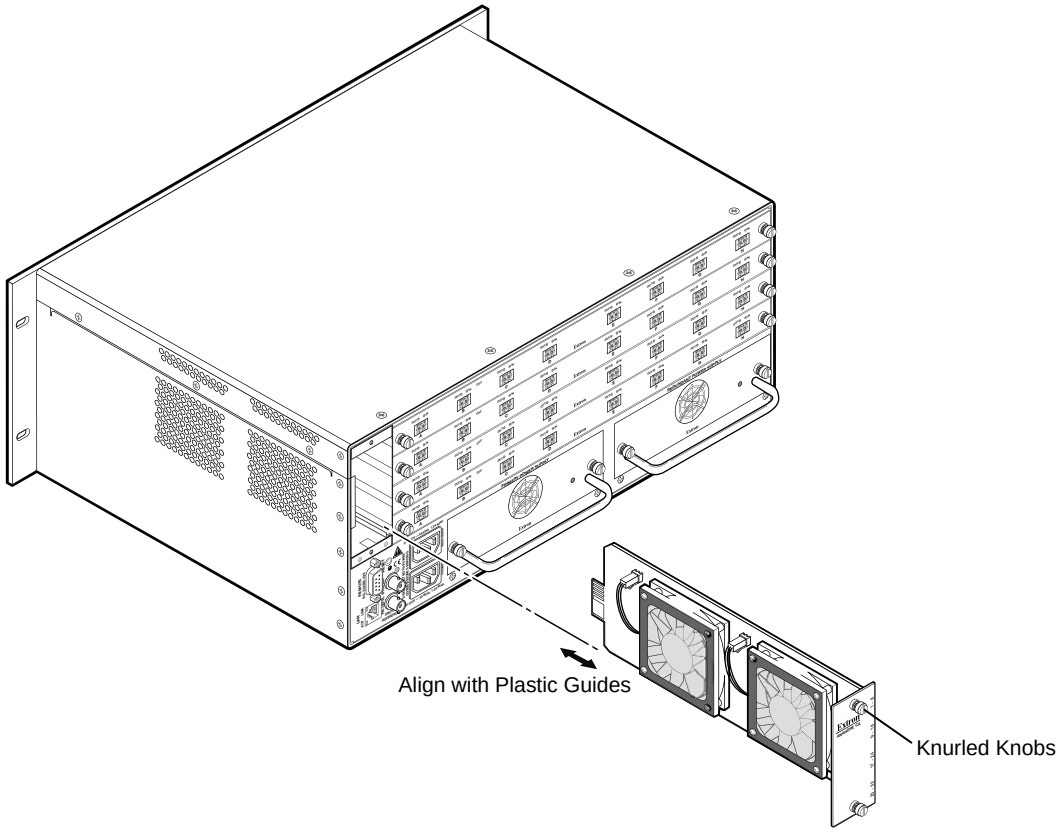


Figure 67. Fan Replacement

2. Gently pull on the screws to loosen the fan from the backplane.
3. Slide the fan out of the chassis.

Installing a Fan Module

1. Orient the fan to be installed so that the printing on the back of the panel is right-side up.
2. Align the flanges on the fan with the top and bottom fan guides (see figure 67).
3. Gently slide the fan into the enclosure until the fan meets resistance.
4. Gently seat the fan in the backplane.
5. Use a screwdriver to tighten the top and bottom captive screws to secure the fan in place.

Removing and Installing Button Labels

Figure 69 on the next page provides strips of blank button labels. If desired, copy them or cut them out, write button information in each button area as desired, and put them in the windows of the input or output buttons. You can also create labels using the Button Label Generator software (see **Button Label Generator Program** on page 91).

Installing Labels in the Buttons

Install new labels in the front panel buttons as follows:

1. Remove the button from the matrix switcher; use a small, flat bladed screwdriver such as an Extron Tweeker to gently pry a button out from the front panel (see figure 68).

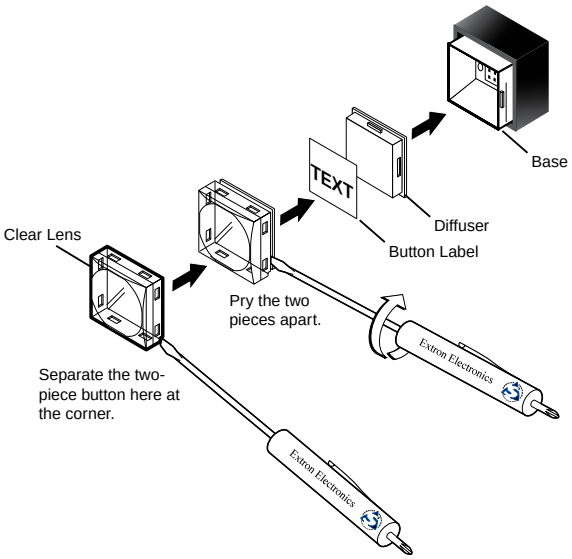


Figure 68. Illuminated Button Label Replacement

2. Locate the notch in the corner of one side of the clear button cap lens.
3. Separate the white backing (diffuser) from the clear button cap (lens); insert the blade of the small screwdriver into the corner notch and gently twist the blade.
4. Save the translucent, white diffuser, but remove the text label insert from the transparent button cap lens.
5. Insert the replacement button label into the button cap. Check for correct label orientation.
6. Align the white diffuser plate with the cap (lens). The bumps on the diffuser plate should be aligned (top and bottom) with the notches on the clear button cap. Firmly snap it into place.
7. Align the tabs on the base of the matrix switcher with the notches on the diffuser plate. Gently, but firmly, press the reassembled button into place on the front panel of the switcher.
8. Repeat steps 1 to 7 as needed to relabel other buttons.

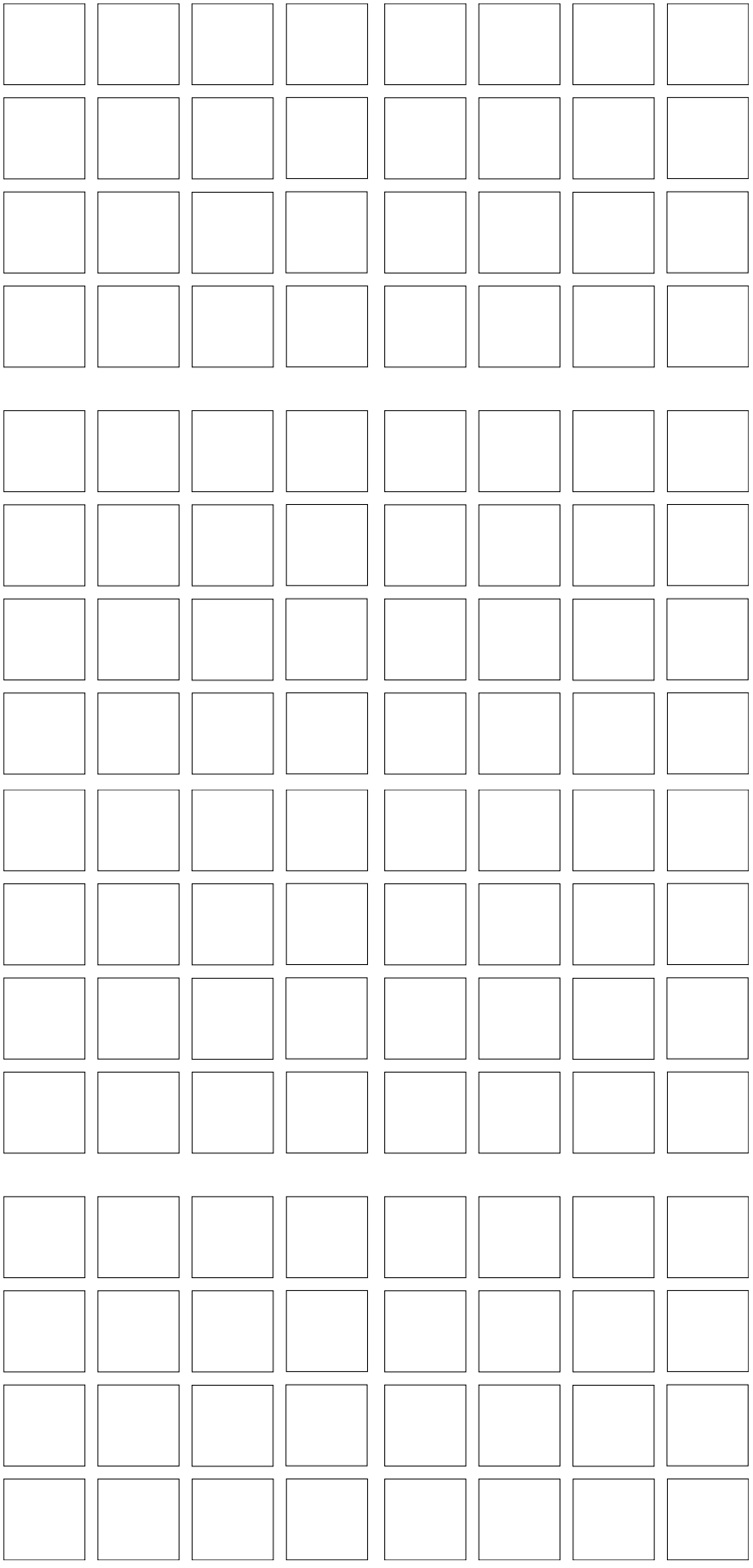


Figure 69. Button Label Blanks

Ethernet Connection

This section provides a high level discussion of the Ethernet connection to the switcher and a primer on the subject of subnetting. Topics that are covered, include:

- **Ethernet Link**
- **Subnetting — A Primer**

Ethernet Link

The rear panel Ethernet connector on the FOX matrix switcher can be connected to an Ethernet LAN or WAN. This connection makes SIS control of the switcher possible using a computer connected to the same LAN.

Ethernet Connection

The Ethernet cable can be terminated as a straight-through cable or a crossover cable and must be properly terminated for your application (see **figure 10** on page 14).

- **Crossover cable** — Direct connection between the computer and the FOX matrix switcher
- **Patch (straight-through) cable** — Connection of the FOX matrix switcher to an Ethernet LAN

Default IP Address

To access the FOX matrix switcher via the LAN port, you need the IP address of the switcher. If the address has been changed to an address comprised of words and characters, you can determine the actual numeric IP address using the ping utility. If the address has not been changed, the factory-specified default is 192.168.254.254.

Ping can also be used to test the Ethernet link to the FOX matrix switcher.

Pinging to Determine the Extron IP Address

The ping utility is available at the **Command** prompt. Ping tests the Ethernet interface between the computer and the FOX matrix switcher. Ping can also be used to determine the actual numeric IP address from an alias and to determine the web address.

Ping the switcher as follows:

1. On the Windows task bar, click on **Start** > **Run**.
2. At the **Open** prompt, type **command**.
3. Click the **OK** button.
4. At the **Command** prompt, type **ping** {*IP address*} and then press <Enter>. The computer returns a display similar to the one shown in figure 70.

```
C:\>ping 192.168.254.254

Pinging 192.168.254.254 with 32 bytes of data:

Reply from 192.168.254.254: bytes=32 time<10ms TTL=128
Reply from 192.168.254.254: bytes=32 time<10ms TTL=128
Reply from 192.168.254.254: bytes=32 time<10ms TTL=128
Reply from 192.168.254.254: bytes=32 time<10ms TTL=128

Ping statistics for 192.168.254.254:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Figure 70. Typical Ping Response

The line **Pinging ...** reports the actual numeric IP address, regardless of whether you entered the actual numeric IP address or an alias name.

Pinging to Determine the Web IP Address

The ping utility has a modifier, **-a**, that directs the command to return the web address rather than the numeric IP address.

At the **Command** prompt, type **ping -a** {*IP address*} and then press <Enter>. The return display is similar to the ping response shown in figure 71, except that when you specify the **-a** modifier, the line **Pinging mail...** reports the web IP address rather than the numeric IP address, regardless of whether you entered the actual numeric IP address or an alias name.

Configuring the Switcher for Network Use via the ARP Command

The ARP (address resolution protocol) command tells your computer to associate the MAC (media access control) address of the FOX matrix switcher with the assigned IP address. You must then use the ping utility to access the controller, at which point the IP address of the controller is reconfigured.

Use ARP to configure the IP address as follows:

1. Obtain a valid IP address for the FOX matrix switcher from your network administrator.
2. Obtain the MAC address (UID #) of the FOX matrix switcher from the label on its rear panel. The MAC address should have this format: 00-05-A6-*xx-xx-xx*.
3. If the FOX matrix switcher has never been configured and is still set for factory defaults, proceed to step 4. If not, perform a mode 4 system reset and then proceed to step 4. For detailed information on reset modes, see **Performing Soft System Resets (Resets 3, 4, and 5)** on page 45.

   NOTE: The FOX matrix switcher must be configured with the factory default IP address (192.168.254.254) before the ARP command is executed, as described below.

4. At the PC, access the `Command` prompt (see **Pinging to Determine the Extron IP Address** on the preceding page, steps 1 through 3), then enter the `arp –s` command. Type in the desired new IP address for the unit (obtained in step 1) and the MAC address of the unit (from the rear panel of the unit), for example, `arp –s 1Ø.13.197.7 ØØ-Ø5-A6-Ø3-69-BØ` and then press <Enter>.

   The computer returns the command prompt (`C:\`).

   After you issue the `arp -s` command, the controller changes to the new address and starts responding to the ping requests to the new address, as described in the next step.

   NOTE: You must ping the FOX matrix switcher for the IP address change to take place. The response should show the new IP address, as shown in figure 71.

5. Execute a ping command by entering ping followed by a space and the new IP address at the command prompt. For example:

   `ping 1Ø.13.197.7`

```
C:\>ping 10.13.197.7

Pinging 10.13.197.7 with 32 bytes of data:

Reply from 10.13.197.7: bytes=32 time<10ms TTL=128
Reply from 10.13.197.7: bytes=32 time<10ms TTL=128
Reply from 10.13.197.7: bytes=32 time<10ms TTL=128
Reply from 10.13.197.7: bytes=32 time<10ms TTL=128

Ping statistics for 10.13.197.7:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Figure 71. Ping with New Address

NOTE: You can reconnect using either Telnet or a web browser to verify that the update was successful.

6. After verifying that the IP address change was successful, enter and issue the arp –d command at the Command prompt. For example:

   `arp –d 1Ø.13.197.7` removes 10.13.197.7 from the ARP table

   or

   `arp –d*` removes all static IP addresses from the ARP table.

Connecting as a Telnet Client

The Microsoft Telnet utility is available from the **Command** prompt. Telnet allows you to input SIS commands to the FOX matrix switcher from the PC via the Ethernet link and the LAN.

Access the **Command** prompt and start Telnet as follows:

1. On the Windows task bar, click **Start** > **Run**.
2. At the **Open** prompt, type **command**.
3. Click the **OK** button.
4. At the **Command** prompt, type **Telnet** and then press <Enter>. The computer returns a display similar to the one shown in figure 72.

```
Microsoft (R) windows 2000 (TM) Version 5.0 (Build 2195)
Welcome to Microsoft Telnet Client
Telnet Client Build 5.00.99203.1

Escape Character is 'CTRL+]'

Microsoft Telnet>
```

Figure 72. Telnet Window

Telnet Tips

It is not the intention of this guide to detail all of the operations and functionality of Telnet; however, some basic level of understanding is necessary for operating the FOX matrix switcher via Telnet.

Open

Connect to the FOX matrix switcher using the Open command. Once you are connected to the switcher, you can enter the SIS commands the same as you would if you were using the RS-232 or RS-422 link.

Connect to the FOX matrix switcher as follows:

1. At the **Telnet** prompt, type **open** {*IP address*} and then press <Enter>.

   If the switcher is not password protected, no further prompts are displayed until you break or disconnect the connection to the matrix switcher.

   If the switcher is password protected, Telnet displays the password prompt.

2. If necessary, at the password prompt, type the appropriate password and then press <Enter>.

   Connection to the switcher via the Ethernet can be password protected. There are two levels of password protection: administrator and user. A person logged on as an administrator has full access to all matrix switcher switching capabilities and editing functions. Users can create ties, set mutes, and view all settings with the exception of passwords. By default, the FOX matrix switcher is shipped with both passwords set to {*carriage return*}.

   Once you are logged in, the switcher returns either `Login Administrator` or `Login User`. No further prompts are displayed until you break or disconnect the connection to the FOX matrix switcher.

Escape character and Esc key

When Telnet is first started, the utility advises that the Escape character is 'Ctrl+]'. Many SIS commands include the keyboard <Esc> key. Consequently, some confusion may exist between the Escape character and the Escape key.

The Telnet Escape character is a key combination, the <Ctrl> key and the <]> key pressed simultaneously, which returns you to the `Telnet` prompt while leaving the connection to the FOX matrix switcher intact.

The Escape key is the <Esc> key on the computer keyboard.

Local echo

Once connected to the FOX matrix switcher, by default, Telnet does not display your keystrokes on the screen. SIS commands are typed in blindly and only the SIS responses are displayed on the screen. To command Telnet to show keystrokes, at the `Telnet` prompt, type `set local_echo` and then press <Enter> before you open the connection to the switcher.

With local echo turned on, keystrokes and the responses of the switcher are displayed on the same line. For example: `1*1!In1 Out1 All`, where `1*1!` is the SIS command and `In1 Out1 All` is the response.

With local echo turned on, all keystrokes are displayed, even those that should be masked, such as the password entry. For example, when entering a password with local echo turned on, you see a display such as `a*d*m*i*n*`, where `admin` is the keyed in password and `*****` is the masked response.

You can turn off local echo by typing `unset local_echo` and then pressing <Enter> at the Telnet prompt. If you are connected to the FOX matrix switcher and need to access the Telnet prompt to turn local echo off, type the Escape character (<Ctrl>+<]>).

Set carriage return-line feed

Unless commanded otherwise, Telnet transmits a line feed character only (no carriage return) to the connected switcher when you press the <Enter> key. This is the correct setting for SIS communication with the switcher. The Telnet `set crlf` command forces Telnet to transmit carriage return and line feed characters when <Enter> is pressed, but if crlf is set, the SIS link with the switcher does not function properly.

Close

To close the link to the switcher, access the `Telnet` prompt by typing the Escape character (<Ctrl>+<]>). At the Telnet prompt, type close, and then press <Enter>.

Help

For Telnet command definitions, at the `Telnet` prompt, type `?` and then press <Enter>.

Quit

Exit the Telnet utility by typing `quit` and then pressing <Enter> at the `Telnet` prompt. If you are connected to the FOX matrix switcher, access the `Telnet` prompt by typing the Escape character (<Ctrl>+<]>).

Subnetting — A Primer

It is not the purpose of this guide to describe TCP/IP protocol in detail. However, some understanding of TCP/IP subnetting (a subnet is a subset of a network — a set of IP devices that have portions of their IP addresses in common) is necessary in order to understand the interaction of the FOX matrix switcher and the mail server gateway. To understand subnetting at the level required to install and operate the FOX matrix switcher, you must understand the concepts of a gateway, local and remote devices, IP addresses and octets, and subnet masks and octets.

Gateways

The FOX matrix switcher can communicate with the email server that the switcher uses for email notification directly (if they are on the same subnet) or the communication can be routed via a gateway (a computer that provides a link between different subnets).

Local and Remote Devices

The local and remote devices are defined from the point of view of the function being described. In this guide, subnetting is an issue when you are using the controlling PC to set TCP/IP and email values in the matrix switcher (see **IP Settings / Options Window** on page 76 and **Email Settings Page** on page 101). When you are setting up the variables for email notification, which may include subnetting, the matrix switcher is the local device and the email server is the remote device.

IP Addresses and Octets

Valid IP addresses consist of four 1-, 2-, or 3-digit numeric subfields, properly called “octets,” separated by dots (periods) (see figure 73). Each octet can be numbered from 000 through 255. Leading zeroes, up to three digits total per octet, are optional. Values of 256 and above are invalid.

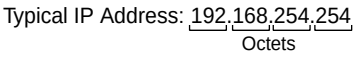


Figure 73. Typical IP Address

Subnet Masks and Octets

The subnet mask (see figure 74) is used to determine whether the local and remote devices are on the same subnet or different subnets. The subnet mask consists of four numeric octets separated by dots. Each octet can be numbered from 000 through 255. Leading zeroes, up to three digits total per octet, are optional. Each octet typically contains either 255 or 0. The octets determine whether or not the same octets of two IP addresses will be compared when determining if two devices are on the same subnet.

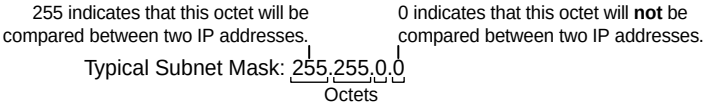

255 indicates that this octet will be compared between two IP addresses.
0 indicates that this octet will **not** be compared between two IP addresses.
Typical Subnet Mask: 255.255.0.0
Octets

Figure 74. Typical Subnet Mask

Determining Whether Devices Are on the Same Subnet

To determine the subnet, the IP address of the local device is compared to the IP address of the remote device (see figure 75). The octets of each address are compared or not compared, depending on the value in the related subnet mask octet.

- If a subnet mask octet contains the value 255, the related octets of the IP addresses of the local device and the remote device are unmasked.

  Unmasked octets are compared (indicated by ? in figure 75).

- If the subnet mask octet contains the value 0, the related octets of the IP addresses of the local device and remote device are masked.

  Masked octets are not compared (indicated by X in figure 75).

If the unmasked octets of the two IP addresses **match** (indicated by = in figure 75, example 1), the two addresses **are on the same subnet**.

If the two unmasked fields **do not match** (indicated by ≠ in figure 75, example 2 and example 3), the addresses **are not on the same subnet**.

	Example 1	Example 2	Example 3
Local IP Address:	192.168.254.254	192.168.254.254	192.168.254.254
Subnet Mask:	255.255.0.0 (?.?.X.X)	255.255.0.0 (?.?.X.X)	255.255.0.0 (?.?.X.X)
Remote IP Address:	192.168.2.25	190.190.2.25	192.190.2.25
Match?:	=.=.X.X — Match (Same subnet)	≠.≠.X.X — No match (Different subnet)	=.≠.X.X — No match (Different subnet)

Figure 75. Comparing the IP Addresses of the Local and Remote Devices

Extron Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

USA, Canada, South America, and Central America:
Extron Electronics
1230 South Lewis Street
Anaheim, CA 92805
U.S.A.

Japan:
Extron Electronics, Japan
Kyodo Building, 16 Ichibancho
Chiyoda-ku, Tokyo 102-0082
Japan

Europe and Africa:
Extron Europe
Hanzeboulevard 10
3825 PH Amersfoort
The Netherlands

China:
Extron China
686 Ronghua Road
Songjiang District
Shanghai 201611
China

Asia:
Extron Asia Pte Ltd
135 Joo Seng Road, #04-01
PM Industrial Bldg.
Singapore 368363
Singapore

Middle East:
Extron Middle East
Dubai Airport Free Zone
F13, PO Box 293666
United Arab Emirates, Dubai

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions, or if modifications were made to the product that were not authorized by Extron.

NOTE: If a product is defective, please call Extron and ask for an Application Engineer to receive an RA (Return Authorization) number. This will begin the repair process.

USA: 714.491.1500 or 800.633.9876
Asia: 65.6383.4400
Europe: 31.33.453.4040
Japan: 81.3.3511.7655

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

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